The Builder.

VOL. LXXXVII.—No. 3234. NOVEMBER 19, 1904.

ILLUSTRATIONS.

Detail of Principal Entrance, Pisa Cathedral.....From a Photograph.
Altar Frontals.....By Mr. Edmund Hunter.
New Offices for the N.E. Railway Company.....Mr. Horace Field, F.R.I.B.A., Architect.
Gardener's Cottage, Great Warley Rectory.....Mr. E. Guy Dawber, F.R.I.B.A., Architect.
Entrance Lodge to House at Amersham.....Mr. T. Phillips Figgis, A.R.I.B.A., Architect.

Illustrations in Text.

Economies of Construction in Small Houses:—
Fig. 1 ..... Page 514

Economies of Construction in Small Houses (*contd.*):—Figs. 2 and 3 ..... Page 515

CONTENTS.

	PAGE
The London Building Act Amendment	507
Notes	509
The Society of Painters in Water-Colours	511
Magazines and Reviews	512
Egypt Exploration Fund	513
Economies of Construction in Small Houses	514
The Architectural Association	516
The Surveyors' Institution	521
Illustrations :—	
Detail of the Principal Entrance, Pisa Cathedral	523
Altar Frontals	523
New Offices for the N.E. Railway Company	523
Cottage, Great Warley; and Lodge at Amersham	523
The Metropolitan Asylums Board	523
The London County Council	523
Applications under the London Building Act, 1894	525
Architectural Societies	525
Engineering Societies	526
Correspondence :—	
Architectural Association Discussion Section	526
Books Received	526
Obituary	526
Competitions	526
General Building News	527
Stained Glass and Decoration	528
Sanitary and Engineering News	528
Foreign	528
Miscellaneous	528
Legal :—	
Building Owner and Architect	529
The Widening of Queen-street, Hammersmith	529
Action between Property Owners in Berkeley-square	530
Liability on Plasterer's Claim under Workmen's Compensation Act	530
Patents	530
Some Recent Sales	531
Meetings	532
Prices Current	532
Tenders	533

The London Building Act Amendment.

CONSIDERING the very long period during which the old London Building Act was left untouched, before it was superseded by that of 1894, the fact that the latter is already about to receive what promise to be numerous and important amendments indicates that there is a much greater activity of mind in regard to such points than existed during the previous half century. The Report of the Building Act Committee of the County Council states that it was originally intended merely to bring in a Bill to amend the 1894 Building Act in relation to provision against danger from fire. The Council however came to the wise decision that if a Bill to touch the Act were to be brought in at all, it would be better to make this the opportunity for drafting and carrying all amendments to the Act which seemed to be required; and accordingly the previous reference to three Committees in relation to provisions against fire was rescinded, on the understanding that the Building Act Committee would proceed with the preparation of proposals for securing all the amendments. The Report of that Committee, which was partially discussed at last Tuesday's meeting of the County Council, was printed in full in our last issue (pages 489 to 491 *ante*). As will be seen, the Committee have not yet published the actual wording proposed for the altered portions of the new Act; they only detail the points in regard to which they propose alteration; so that a great deal yet remains to be done before any Parliamentary action can be taken.

The first of the suggestions given under "details" in the Report includes the proposal "to define certain terms not at present defined"; there is no suggestion as to what these are, but it is to be hoped that it is at last intended to define "building" and "structure," words which are used in the existing Act as if they had a different meaning, but of which neither is defined. To pass an Act to regulate buildings, and to omit to define what legally constitutes a "building" is certainly one of the most extraordinary oversights ever made in an Act of Parliament, and it seems amazing that it should have been allowed to pass. It is also proposed in the next paragraph of the Report to amend the provisions as to what constitutes "the commencement to form or lay out a street," a reform also urgently demanded in the face of the extraordinary wording of section 8 of the present Act, wherein it is stated that certain acts constitute a commencement to form or lay out a street, unless the person concerned shall have done any of these acts "for some purpose other than that of forming or laying out a street"; so that, as far as the wording goes, he has only to affirm that he had "some other purpose," to put himself outside the Act; a laxity of definition almost as inconceivable as the omission to define "building." Among the proposed alterations in regard to streets we are glad to see that it is proposed "to enable the Council to require a greater width than at present" "in the case of new streets or the adaptation of ways to streets"; a rather vague sentence which, it is to be hoped, amounts to a confession that the limits of street width in the present Act are too small. It is also proposed to make universal the requirement, at present absurdly limited to "dwellings for the working classes" (by the way is the new Act to define "the working classes"?), that a dwelling-house within a distance of 20 ft. from the centre of the roadway shall not be erected to a height greater than the distance to the nearest external wall on the opposite side of the street. But the most satisfactory point in reference to this part of the subject is that it is intended to provide that in new streets "no building shall exceed in height the distance between buildings on opposite sides of the streets." That is what has been wanted all along; and that will put an end to the absurd anomaly in the existing Act, which we pointed out at the time it was passed, that with a street 49 ft. in width the height of buildings is limited to the width of the street, but that the moment you get to 50 ft. wide you may carry the buildings to a height of 80 ft. But why not go a step further, and apply the same rule to new buildings erected in an old street? Private owners would grumble, no doubt, and it might be a case for compensation, but it would unquestionably be for the public good.

The proposed alterations in regard to building line seem also to indicate that the authorities are at last waking up to the

fact that the contemplated widths for new streets in the existing Act are too narrow. It is now proposed that the buildings in any new street not within two miles of St. Paul's shall not be nearer to the centre of the road than 35 ft. without consent; and that the Council shall have power to define a building line in any important street "not being at any point more than 75 ft. distant from the centre of the roadway." This is a change indeed from the provision of the existing Act, that the Council should have no power to require a greater width than 60 ft. for any street. It is proposed also to provide that on payment of compensation the Council may require any building or structure projecting beyond their defined building line to be set back.

The suggestions as to the naming and numbering of streets seem to be redundant in some points and deficient in one very important one. It seems contemplated that the Council should now take the initiative in street naming, instead of merely exercising a veto over any name they may disapprove of; but they already have power (section 34) to alter the name of any street to any other name they think fit. Section 33 already provides that the local authority is to paint or affix the name of a street, so that we do not see the point of the new suggestion in the Report "to require the local authority and not the owner to set up the new name whenever the Council finds it necessary to change the name," etc. But what we do not see in the Report, and should have wished to see, is some decisive provision for the compulsory naming of streets at every corner and on a definite system, as is done in Paris. The existing Act uses the vague phrase that the local authority "shall and may" cause the name of every street to be affixed "on a conspicuous part of some house or building at or near each end or entrance to such street, or some other convenient part of the street." This is not precise enough; it is at the entry to the street, at the corner of each street, that we want to see the name. But even as it is, it is disgracefully neglected by local authorities. A man who goes into any neighbourhood in London with which he is not familiar, is likely to have difficulties in finding the street he wants. He will probably pass corner after corner where there is no name to the street, and where, if the names are written up, they are in all kinds of different forms and lettering; no rule is followed. What we ought to see in the amended Act is some such clause as this:—

"The Council will decide upon the best and most convenient form of lettering for the names of streets, and on the material and the manner of fixing the names; and the local authorities are bound to adopt this general model, and to affix names, designed and executed on the same model, at the corners of all streets in their district; and the local District Surveyor shall be considered responsible for carrying out this regulation."

If some such clause as this were inserted in the Act, and its operation insisted on, we should at last have all our London streets fully and legibly named and labelled, in the same form and lettering, in place of the present partial and haphazard lettering, the result merely of carelessness and want of system, and which is a discredit to London.

The suggestions in regard to open spaces in connexion with buildings, though rather vaguely expressed, obviously point to an intention of enlarging the scope of these provisions, one sentence in fact running—"To provide that open spaces behind houses shall be larger than the present Act requires"; which is certainly in the right direction, for the open space provision is small enough at present. There is a want of logical clearness and decision in some of these paragraphs; *e.g.*:—

"To require the space at the rear of all buildings used solely for dwelling purposes, in streets laid out before the commencement of the Act of 1894, to be provided at the level of the adjoining pavement."

This is just what the existing Act provides (section 40); the only real difference being that section 40 restricts the requirement to domestic buildings erected since the Act of 1894, while it is now proposed to make the provision retrospective, and apply it to buildings erected at any time before the 1894 Act. It would surely have been simpler and more sensible to state it that way, instead of bringing in what at first sight seems to be a new proposal. Among other proposals are those for making a minimum provision for ventilation to an enclosed court; to omit from section 45 the second paragraph (allowing a court of which the greater dimension is not more than twice the lesser one, if equivalent in area to the required space); and to apply the third paragraph of the same section to any habitable room, whether above or below the level of the ground story. This is in the direction of common sense; why the existing paragraph was not to apply to windows in ground floor and basement is one of the numerous little puzzles of the existing Act; one presumes there was some motive in the mind of the framer of the existing paragraph; but it is difficult to understand what it could have been.

The proposals for providing against danger from fire may seem rather numerous and drastic, and we understand that the report of them has already raised alarm in the minds of property-owners and intending building-owners, but we do not see that there is anything more than reasonable in them, considering the terrible examples we have had of the danger from inadequate construction and insufficient means of exit in city fires. The greater proportion of them deal with the provision of means of escape, but there are one or two important provisions in regard to structure. Floors of wooden joists with concrete pugging are now to be recognised as fire-resisting, which is a concession, though a perfectly right one; an exception being made in regard to floors over any room in which a furnace is fixed. The lesson from the Whitechapel fire has evidently led to a provision that windows of warehouses within 30 ft. of openings of other premises (should not this be "of premises opposite"?) shall be protected in a prescribed manner to prevent the spread of fire. Another provision that we are very glad to see proposed is that "boarding and panelling shall be so fixed as not to allow of any space between it and the wall," and such work is to come under section 145 of the present Act, viz.: work of which notice is to be given to the District Surveyor. Though this comes under the head of provisions against fire, in reality it is a salutary provision for other reasons. We have always been of opinion that hollow spaces that no one can get at are most undesirable in any building, from a sanitary as well as from a fire-protection point of view.

Under the head of "construction" a general paragraph promising to provide for and regulate the use of iron and steel construction in buildings was almost a matter of course; no details are as yet given. The proposal to increase the minimum height of "habitable" rooms by 6 in. will no doubt meet with opposition, as unnecessary, but we entirely approve of it. In regard to habitable rooms over stables there is a proposal to extend the provision as to floors to rooms over coach-houses and harness-rooms; this seems unnecessary unless such rooms communicated with the stable, which they never should do. Indeed, it seems to us that 70 *e* of the existing Act provides all that is necessary. When reviewing the existing Act we asked why the wall between the staircase and the stable must be of brick, when concrete would be just as effectual. In the new proposal there is the opposite mistake, and only concrete is specified for both. It should be "brickwork in cement *or* concrete." Paragraphs of this kind seem to be drafted without sufficient thought as to facts and wording. We note that in regard to certain points of construction (of what nature is not indicated) there is to be a right of appeal to the superintending architect against the judgment of the District Surveyor; a very benevolent provision. An architect may have a new method of construction which is perfectly sound, and which a surveyor may condemn merely because it is unusual or against the letter of the law.

To provide for horizontal separation of properties as an alternative to separation by party walls is a step which the increasing use of solid floors, and the constant subdivision of properties or tenements within the same general exterior structure, renders both possible and desirable.

Among the "Miscellaneous" provisions is one very important one, which has long been called for; to enable the Council to sanction the cubical contents of buildings to be used for trade or manufacture, "or for any purpose which the Council may think it expedient to permit," being of such dimensions as the Council may think necessary. The restrictions of section 75 in the existing Act are vexatious at a time when buildings are so frequently being required of a larger extent for manufacture or storage, and the safety of such buildings really depends not so much on their limit of size as on their manner of construction; and a special provision "to empower the Council to require the maintenance of proper arrangements for lessening danger from fire in buildings of large cubical extent" is suggested in another portion of the Report, which probably has reference to the paragraph before named, though the two are under different headings: they should have been placed together. And the paragraph—"to provide that where an old building is taken down or destroyed for

more than half its cubical extent, the remaining portion of the building shall be demolished or made in all respects to conform with the provisions of the Act"—seems only another way of expressing what is already provided for under "Definitions" in section 5 of the existing Act, which provides that "any building which has been taken down for more than half of its cubical extent and re-erected or commenced to be re-erected wholly or partially on the same site after the commencement of this Act" comes thereby under the definition of a "new building," and is therefore subject to all the provisions affecting new buildings; the powers to deal with the case are sufficient already; the new paragraph is superfluous. Under the same heading, "Miscellaneous," is a provision "to revise the schedule of fire-resisting materials." This is undoubtedly necessary, and we should recommend that the amended Act should include the power to revise the schedule from time to time at the discretion of the Council, since new fire-resisting materials are frequently brought forward.

The proposal to give the Council powers to introduce the system of paying District Surveyors by salary, if they wish to do so, will no doubt arouse some opposition, but in itself it is a move in the right direction. Human nature being what it is, it is almost impossible that there should not be aroused, in some cases at all events, a disposition on the part of the Surveyor to lie in wait for faults, to be "extreme to mark what is done amiss," when every fault that can be established is something in his own pocket; and even where he is quite free from such a reproach, he will not be thought to be so by the people whom he fines. The objection to salaries is that in most districts they cannot be such as to attract the best class of men, if the Surveyor is to be debarred from private practice; and *there* lies the great mistake of the County Council, which they have now an opportunity to correct. When the District Surveyorship was an appendage to private practice, the Council had some of the leading architects of London looking after the construction of new buildings; men whose names and position had weight in themselves. By abolishing the system they deprived themselves of the services of this class of architects and surveyors. Their wisest course would be to take this opportunity of restoring that state of things, and throwing open the District Surveyorships to men in private practice. In that case the salary system could be established without extravagant cost, since a salary which would be insufficient in itself to attract a man in high position may very well be accepted by such a man as an addition to his private professional income.

It is proposed to increase the numbers of the Tribunal of Appeal to five; one member (not a member of the Council) to be appointed by the Council, the fifth to be chosen by the other four, and to be a Barrister of not less than ten years' standing, who shall be chairman. Why a lawyer should be supposed to be a better chairman of the Tribunal than an architect or a surveyor we fail to see. It is very well to provide that a lawyer should be a member of the Tribunal—his assistance would no doubt often be most useful; but why make him *ex officio* chairman? A still more surprising proposal, and one that we cannot understand in the least, is that no "architect or surveyor practising in London shall be eligible as a member of the Tribunal." Has there been any experience in regard to the action or judgments of the Tribunal hitherto to give any colour or excuse for such a provision? It appears to us to be a preposterous one. Who is likely to be so well able to understand the points or the special difficulties of a case in London building, an architect or surveyor familiar with work in London, or a provincial man who is familiar with work under local conditions only? Or is it intended that architects and surveyors are not to be members of the Tribunal at all? The proposal appears to us not only to be absurd and uncalled for, but to imply a kind of insult to the whole profession in London, as if there were no men among them who could be trusted to act with impartiality. We shall be surprised if such a proposal is sanctioned.

NOTES.

The Channel Tunnel.

THIS subject was brought forward for discussion at a meeting of the London Chamber of Commerce a few nights ago, when Sir John Jackson and other speakers expressed themselves in favour of the construction of the tunnel. None of these gentlemen appeared to anticipate any serious difficulty in the execution of the work, but this is a view which, in the present state of knowledge as to the precise condition of the strata for the entire length of the proposed route, we are not prepared to endorse. Circumstances already ascertained seem to point to the possibility of a serious fault in the stratum of clay upon which the practicability of the project largely depends, and the great depth of the workings would render impracticable the employment of compressed air for the exclusion of water in the case of any fault being discovered in mid-channel. Moreover, the ventilation of a tunnel more than 20 miles in length would constitute a most serious and difficult problem, for which a satisfactory solution could scarcely be found without involving the establishment of two or more island ventilating shafts in the open sea. We have already pointed out in a previous "Note" the disadvantages of long tunnels from the hygienic standpoint, and experience of subways in the metropolis does not encourage confidence in tunnel engineers as experts in the practice of ventilation.

Coast Erosion.

TWO PAPERS on this important subject, read before the Institution of Civil Engineers last week, were further discussed on Tuesday last. The first paper is mainly directed to the question of constituting a single authority for the purpose of dealing in a comprehensive manner with the entire coast-line of England and Wales. We entirely approve of the proposals made by the author, and feel sure that the evils arising out of inaction in some places and ill-advised action in others can only be combated by properly organised efforts instituted with due regard to the requirements of all places on the seaboard. Our own sporadic methods and the general indifference of our Government stand in strong contrast to the businesslike manner in which coast protection is conducted and regarded in Holland and Belgium. In this connexion we may mention the curious differences existing between theory and practice in England and Belgium. In this country the Government claims absolute authority over the foreshores, but does nothing for their protection, except in a few special cases. On the other hand, the Belgian Government, although accepting no responsibility whatever, devotes large sums of money to, and takes great practical interest in, defensive works. The second paper, by Mr. E. R. Matthews, is of more limited interest, being devoted principally to the effects of erosion on the coast between Bridlington and Spurn Head. Still, it has the effect of showing the enormous proportions of the work, and the difficult character of the problems, that would be involved in a scheme for safeguarding the entire coast-line. For instance, the author is of opinion that the protection of the whole Holderness coast would require an expenditure of about 1,250,000*l*., while the value of the agricultural land saved during thirty-three years would not be more than 34,000*l*. These figures make clear the fact that owners of land in the immediate vicinity of the sea cannot be expected to bear more than a small part of the cost if exceptionally heavy outlay should become necessary. No doubt the case cited is exceptional, and the estimate may be unduly high, but it serves to suggest that protective works ought to be treated primarily from the national standpoint.

Egyptian Irrigation Works.

AT a meeting of the Council of Ministers last month it was decided to recommend the Khedive to authorise the raising of the Assouan Dam, and the construction of a barrage—similar in design to that of Assiout—near Esneh, a town of some 15,000 inhabitants between Assouan and Assiout. Both of these undertakings are included in the new irrigation programme which was fully discussed in our columns two or three months ago. While referring to this subject, we may mention that by a Khedival decree Sir William Garstin has been promoted from the position of the Under-Secretary of State to that of Adviser to the Khedive in Affairs Relating to Public Works, with a status equal to that of the Financial and Judicial Advisers. Knowing the thoroughly conscientious and able manner in which Sir William has laboured for years past in the endeavour to prepare the way for the complete engineering control of the Nile, we heartily congratulate him upon the recent official recognition of his invaluable services. He has a special claim to the thanks of our readers because of the sympathetic interest he has always displayed in the ancient monuments of Egypt and for the measures

he has invariably authorised, when within his power, for their preservation and repair.

Sub-Contractors and Compensation. THE case of Evans *v.* Cook, decided by the Court of Appeal on the 10th inst., merely determines an important point of practice. The respondents were builders who were constructing a workhouse infirmary, and had employed sub-contractors to do the plastering. One of the sub-contractor's men sustained an injury, and the respondents, by agreement, had paid him weekly compensation. The respondents then, under section 4 of the Act, claimed an indemnity from the sub-contractors, who brought their insurers in as third parties to the action in the High Court. It was contended that the respondents had no right to bring an action for indemnity in the High Court, but could only proceed under the Workmen's Compensation Act by arbitration. The Court held that the provisions as to arbitration contained in the Act apply only where there is a question as between the workman and the employers or undertakers as to the amount of the compensation, but that they have no application where, as in this case, that question has been settled by agreement.

Workmen's Compensation. IN the case of Pattison *v.* White & Co., decided by the Court of Appeal in August, the question was raised as to the meaning of the words "on, in, or about" in connexion with an "engineering work." The employers were contractors constructing a light railway for the Corporation of Darlington. The claim made upon them was in respect of the death of a carter who was engaged in bringing sand to the works from a pit distant 3½ miles from there. This man was killed by accident at a spot 2½ miles from the works. On his behalf it was contended that in connexion with the first half of the definition of "engineering work," that is to say, "any work of construction, alteration, or repair of a railroad, harbour, dock, canal, or sewer," the words denoted the labour bestowed, and not the works themselves, and that the idea of "physical contiguity" to the works had no application. This contention was negatived on the authority of the cases, Chambers *v.* Whitehaven Harbour Commissioners (1899, 2 Q. B., 132) and Atkinson *v.* Lumb (1903, 1 K. B., 860). In this last case it may be observed that the man was injured when working some 500 yards from the works—the construction of a reservoir in which machinery had to be employed—and he was held to be within the physical area and entitled to compensation. The Departmental Committee have advocated the abolition of this idea of physical contiguity as attached to compensation in the employment and the above cases well illustrate the necessity for reform. At what particular point between the quarter of a mile denoted in Atkinson *v.* Lumb and the 2½ miles in the case under consideration does the workman pass from the protection of the Act? It is obviously inequitable that he should do so at all if his employment remains the same.

Elementary and Secondary Schools. A PAPER on "The New Education Code and the Report of the Mosely Commission" was read by Mr. W. Osborne Smith before the Sanitary Institute last week, and is in the main a critical commentary on the Board of Education's rules for the planning of elementary and secondary schools. Mr. Smith thinks that "in most cases" it is "quite unnecessary and undesirable from the point of view of health and supervision" that the closets of elementary schools should be, as the rules require, "at a short distance and completely disconnected from the school." We should say that "from the point of view of health" the rule errs, if at all, on the safe side, and that it is not wise in most cases to place within the school groups of water-closets and urinals for the use of young and irresponsible children. We have greater sympathy with Mr. Smith's remarks on the importance of sunshine in class-rooms, but, as to the relation of this to the central hall type of plan, we may note in passing that, if the axis of the central hall is placed due north and south, or approximately so, the class-rooms at the sides will not be entirely sunless. Other critical remarks refer to floor space, ventilation, the spacing of hat-and-coat hooks, single and other desks, and to various details of construction. Very little is said about the discoveries of the Mosely Educational Commission in America, but the paper as a whole is a sane and useful contribution to the literature of an important and interesting subject. It would have been still more valuable if it had been longer.

Preservation of Stone. IN a letter in the *Times* of the 15th inst., Mr. Thackeray Turner, Secretary to the Society for the Protection of Ancient Buildings, draws attention to the decay of the stonework of many of our ancient buildings, and concludes (we think rightly) that more damage is done by the corrosive gases and vapours evolved from burning coal than by rains, winds, and frosts acting in the absence of coal smoke. To arrest this decay Mr. Turner and his committee advocate the use of lime-wash, the lime-wash to be repeatedly applied to the face of the stone. For reasons which are obvious to all who have any chemical knowledge, lime-wash is very inferior to baryta-wash as a preservative for calcareous stones, and we think the process adopted by Professor A. H. Church for preserving decayed stonework in the Chapter House, Westminster Abbey, is much preferable to that advocated by Mr. Turner. This process consists in first cleansing the surface of the stone with the aid of an air-blast, and then, by means of a pneumatic diffuser, injecting a saturated solution of barium hydrate into the pores of the stone. The injection is repeated several times. By the use of barium hydrate instead of calcium hydrate (lime-wash), sulphate of barium instead of sulphate of lime is eventually formed in the pores of the stone for a distance of several inches from the surface. Since sulphate of barium is practically insoluble in rain water and in dilute acids, whereas sulphate of lime is distinctly soluble, the advantage of using baryta-wash instead of lime-wash is evident. Calcium sulphate has, moreover, a greater tendency to cause exfoliation of the stone. Those interested in the preservation of calcareous stones will find much valuable information in the reports of Professor Church on the treatment of the decayed stonework in the Chapter House, Westminster Abbey, to the First Commissioner of H.M.'s Works, dated May 28, 1901, and November 18, 1903, respectively.

Institution of Electrical Engineers. MR. ALEXANDER SIEMENS gave his presidential address at the opening meeting of the Institution of Electrical Engineers last week. He began by discussing the relations between capital, labour, and the management of works. He laid great stress on the ill-advised action of workmen's trade unions in restricting the output of works, and pointed out that the effect of this action was generally to throw more and more workmen out of employment, due to the fact that when the price of an article rises owing to the restricted output then a number of consumers begin to do without it, and the demand for it diminishes. The converse of this is also true, namely, that when the price of an article is lowered the demand for it increases rapidly, so that, as a rule, more workmen are employed. Glow lamps were first made by a few highly-skilled workmen and sold at 25s. each. Naturally the demand for them was small. At the present time, when lamps can be had for a shilling each, thousands of skilled workmen are employed in making them, and tens of thousands of unskilled workmen are employed in tending the machinery, packing the lamps, etc. Mr. Siemens said that in times of depression the only remedy the workmen's representatives would suggest was "restricting the output." They could not see that lowering the wages, thus lowering the cost of production, would increase the demand, and so provide labour for more workmen. It seemed to us, however, that Mr. Siemens looked upon the question too much from the employers' point of view, and that something could be said in favour of the workmen's contention that this style of reasoning would lead to the conclusion "that everybody would find employment if no wages were paid at all!" In concluding his address the President made a strong plea in favour of the universal adoption of the metrical system. He pointed out that the feature in electrical measurements which had contributed most to the rapid rise of the industry was that all countries adopted the same units of measurement. Some prominent engineers profess to have tried to work with metrical units, and to have found that they could not work as quickly and easily with them as with their accustomed units. In his opinion, their conclusion on this particular matter is about as trustworthy as that of the man who tries to skate, and, after his first attempt, says that he has proved that you cannot skate faster than you can walk.

King's Ferry Bridge, Sheppey. AN interesting example of modern bridge construction is to be found in the new highway and railway bridge over the Swale at King's Ferry, between the Isle

of Sheppey and the mainland of Kent. This structure is of the Scherzer rolling-lift type, and the only other bridge of the kind in this country is one at Barking, in Essex. The bascule, providing for the passage of vessels with fixed masts, has an enlarged end of curved form which, when the span is being opened, is rotated so as to come into contact with a track forming a kind of rolling hinge. This type of construction has been very largely employed in the United States, and its simplicity is certainly a great recommendation.

The Plummer Tower, Newcastle-on-Tyne.

MYSTERY still surrounds the fate of the Plummer Tower on the wall of Newcastle. In August last we drew attention to the threatened destruction of this ancient landmark, and to the strange reticence displayed by its owners as to the actual state of negotiations then believed to be pending with regard to its disposal. It now appears from a report of the Town Improvement Committee that a serious proposal is before the City Council to purchase and remove the tower for the purpose of widening Croft-street. By all means let the authorities buy this historic relic with a view to its preservation, but they should not be allowed to make away with it for a comparatively unimportant street improvement that could easily be effected by some alternative means.

Burlington Arcade.

THE new entrance gates and railings, bearing the heraldical coronet, crest, and motto of the house of Cavendish, which have just been erected at the ends of Burlington Arcade, are the work of Messrs. Hill & Smith, of Brierley Hill, Staffordshire, and replace the old and more cumbrous iron-work. The arcade, built after Samuel Ware's designs, was opened on March 20, 1819, having been erected by Lord George Cavendish (Earl of Burlington) upon the Duke of Devonshire's land to serve as a screen between Burlington House and its gardens and the houses in Old Bond-street. Lord George wanted to build a similar screen along the east side of his property in that part of Piccadilly, but the tenants of the Albany successfully resisted the project. Since the demolition of the elder Sydney Smirke's (New) Exeter Change leading out of Wellington-street into Catherine-street, Strand, for the building in 1862 of the Strand Music Hall, and of W. Young's Lowther Arcade for Messrs. Coutts & Co.'s new bank, the arcade which Nash and Repton built in 1816-19 along the west side of the Haymarket Opera House, the Burlington Arcade, and its recent neighbour in Old Bond-street remain as the only covered passages with shops, being thoroughfares, after their kind in London; the two in Ludgate-hill have no features of an architectural character.

The New English Art Club.

A CONSIDERABLE number of the works exhibited at the New English Art Club suggest the idea that the gallery is the refuge of the pavement artist. There is hardly a work in the gallery which we should call really a picture in the full sense of the word. Mr. Mark Fisher's "A Garden Walk" (50) is an exception, though it is hardly one of his best works. Powerful sketches there are, like Mr. Rich's "In Danny Park" (20) and "Near Hurstpierpoint" (34); Professor Fred Brown's "A Valley" (102) and "The Edge of the Park" (112), and some others. There is a large study for a portrait by Mr. Furse, which is of interest in every sense; and two or three hasty studies for pictures by Mr. Sargent, which of course are also of interest; but are such rough studies, for the artist's own use, things for exhibition? There are qualities in Mr. Wilson Steer's "Twilight" (54), but in his "Storm" (58) we are again reminded of the pavement artist. Mr. Roger Fry treats architectural subjects well on a small scale, and his "Christ Church Library" (6) shows the texture of stone work, in contrast with an architectural subject next to it (7) where there is no texture at all, and the bridge might be made of mud. Texture seems to go for nothing with some even of the best exhibitors here; Mr. W. Rothenstein's "Deserted Quarry" (62), for instance, is a powerful composition, but the quarry might be cut out in cheese, for any special idea of surface that we get. As to some of the things exhibited—formless dabs of colour which we are asked to accept as architectural subjects; heads and half-lengths of personages apparently selected for their repulsive appearance, or made repulsive by the way they are treated, we do not care to particularise: but it is melancholy to see such things put forth as "art," and supported, as they are in some of the daily papers, by people who call themselves "art critics."

Drawings by Mr. Harry Goodwin.

AFTER the New English Art Club, it is refreshing to look at a set of water-colours, like the "English Towns and Swiss Mountains" of Mr. Harry Goodwin (Messrs. Dickinson's Gallery), which are really beautiful and delicate art work, and are finished. All are good; among those we may specially mention are "A Pool under Monte Rosa" (30); "An Alpine Footpath" (38); "The Calm before the Storm, Lake of Geneva" (41); "Morning on the Old Bridge Lucerne" (57); and "The Old Church, Maidstone" (17). We may add that where Mr. Goodwin introduces architecture in his composition it is always well and conscientiously treated.

THE SOCIETY OF PAINTERS IN WATER-COLOURS.

THE first drawing numbered in the catalogue of the Society of Painters in Water-colours is an architectural one of the most delicate beauty and finish; that of "The Great Church, Dordrecht" by Mr. Reginald Barratt. There are few artists of the day who paint architecture like this, combining accuracy of draughtsmanship with a feeling for colour and artistic effect; this is a real picture, which at the same time gives a perfectly satisfactory representation of architectural detail and material. Mr. Barratt's other drawings are all good, but none equal to this, and there seems to have been a little oversight in the view of the angle of the Ducal Palace (135: "A Summer Evening, Venice"), for one can hardly imagine that the piers of the two front arcades, on the side furthest from the spectator, could from any standpoint be all hidden behind the nearer ones on the return side, and the impression is produced that the arcades towards the front are missing. If the point of view has been specially selected so as to give a clear vista through the arcades in this way, it is not the best for the effect of the building, which looks as if it wanted solidity. Architectural drawing which is simply architectural and not pictorial is illustrated in Mr. Rooke's large interior "The Choir of Le Mans Cathedral" (57); irreproachable in drawing and perspective, but totally wanting in sentiment and, we must say, deficient in texture and in the expression of different planes of distance, the masonry of the near piers not appearing to stand out in any way from that of the aisle wall in the rear. This is architectural drawing, but it is not a picture, in the full sense of the word. In Mr. R. W. Allan's "Amiens Cathedral" (43) we have the other extreme, in which the building is used for pictorial effect alone without the slightest attempt to indicate detail, the architecture being only shown in a collection of dabs with a wet brush. Here, of course, the artist was only aiming at general pictorial effect and not professing to paint architecture; but we think that architecture, if used as part of the material of a picture, demands a rather more decisive treatment than that.

How different this is with Mr. Albert Goodwin's pictures of cities, which, as we have before observed, are somewhat too dream-like in their delicacy of tint, but in which the buildings, though subservient to a general effect, are treated with most conscientious care, the smaller details being even, if we mistake not, lined in with a pen, before or after the brush-work. "Winchester" (37), with a rainbow resting on the cathedral, is an exquisite example of this class of the artist's work. In a more romantic vein is his fine "Sea Dirge" (80), a red sunset, a lonely shore, and wrecks, conbining to make a gloomy poem which is very impressive. "Venice, from the Hebrew Cemetery" (15), is another work of the same poetic cast; Venice is only dimly discerned in outline through mist and cloud, seen from a foreground—

"By Lido's wet accursed graves,"

and with a very fine and effective treatment of a stormy sky.

A feature in the exhibition is the collection at one end of the room of four or five drawings, two of them large ones, by the late Mr. Arthur Melville, who, whatever one may think of his method, was an artist of real genius, and a great loss to the Society. He carried the system of painting by dots and dabs of colour too far, so that form is almost sacrificed for colour and effect; but he unquestionably achieved great brilliancy and brightness by this method of handling, and his drawing "The Green Minaret" (211), whether we are to regard it as finished or not, is one of the best things in the gallery. Among the more recent members Mr. Walter West more than keeps up the promise of his earlier appearances; "The Quakeress" (150) presents a lady in the costume of her sect, her long grey funnel-like bonnet on her knee, and with a head which is perfectly beautiful for finish of execution and refined character; the pencil study for the figure (202) is perhaps even more charming. The fine colour in the interior entitled "A Silken Cord" (27) also attracts one, though the figures are less interesting. As Mr. West likes to paint the costumes and surroundings of that period, he is a painter who might do something for the illustration of Jane Austen's scenes, so strangely neglected by artists. Figure pictures are generally less numerous than landscapes at the Society's exhibitions, but we should mention "The Watchers" (176), a very charming and suggestive composition by Mr. Anning Bell, which we like better than his larger work "The Garden of the Sleeping Beauty" (164), very much spoiled in a decorative sense by the ugly trellis in the foreground; since this is a purely ideal work, surely something more pleasing might have been invented as a foreground object. Miss Rose Barton's portrait of a child seated by a pond (293) is excellent, and still better her terrace and infantine children under the title "Grab" (63); she is always characteristic in her treatment of children. Mr. Rackham's grotesque bogie pictures are undoubtedly very clever, but we do not think that they are the things to include in a high-class exhibition. A very realistic study of a lobster is exhibited by Mr. Edwin Alexander (239); it is worth something to see the thing so well done, though it is only what the Royal Academy would class among "mere transcripts of the objects of natural history," and therefore inadmissible.

Among landscapes not already mentioned

are two by Mr. Eyre Walker of the cliffs above Farringford (29 and 141) remarkable not only for their fine broad style, but for their great truthfulness to the scene, especially No. 29. "Mallerstang Edge" (129) is another by the same artist, who also, in "Ox-eye Daisies—Early Morning" (125) gives us a flat composition and a crowd of wild flowers, as well painted as his hill scenes. Mr. Colin B. Philip's "The Wild West Wind" (49) is a grand hill landscape in his best style. There are too many interesting landscapes even to mention all; among Mr. Robert Little's various drawings, all fine, that of "Crichtoun" (93) is grand in composition, and impressive in spite of its small scale. Mr. Thorne-Waite's "The South Downs" (30), with their rolling surfaces fainter and fainter in succeeding planes of distance, is a true representation of a landscape that, whether in reality or in painting, seems never to tire. Mr. Callow, whose architectural subjects have for many years, we confess, left us unimpressed by their conventional style, arrests attention by exhibiting two of his early landscape sketches, of which "Distant view of Bamboro' Castle—sketched from nature 1843" (84) is exceedingly fine, and far more interesting than his present drawings of old street scenes. Mr. Callow should exhibit some more of these early sketches. Mr. H. S. Tuke, who generally paints boys bathing, on this occasion sends various clever sketches of shipping; Miss Mildred Butler has a splendid study of "Perennial Poppies" (301) flashing red against a background of dark foliage; also should we praise her "Gay Garden" (192) and her "Ramblers" (126), an admirable study of peacocks wandering in the fields, where they look curiously out of place; one always somehow associates peacocks with a formal garden and a balustrade. Among works with a particular and specialised kind of interest, we may note how decidedly Mr. Cameron's "Autumn on the Tay" (77) is an etcher's landscape, a composition which would come out better in etching and is hardly satisfactory as a water-colour; and how distinctly Mr. Louis Davis's "October Showers" (97) is a stained glass artist's landscape, which would work out admirably in that form, though effective and poetic also as a water-colour; and that Mr. Rackham shows, in his peculiarly delicate little picture "Sussex Farmstead" (226), a little gem of a drawing, that he can do something better than bogie-pictures; we should like to see more of this kind of work from him, instead of the jokes to which he has hitherto confined himself, and which are hardly worth the talent bestowed on them.

MAGAZINES AND REVIEWS.

THE *Quarterly Review* contains an article on "The Palace of Knossos," by Mr. D. G. Hogarth, and accompanied by a pretty large reproduction of the plan of the later Palace as excavated, drawn out by Mr. Theodore Fyfe, and stated to be the most complete yet issued. Mr. Hogarth remarks on the great advantage which Dr. Evans, as an explorer, has had in his previous knowledge of prehistoric archæology and of local antiquities. While unquestionably the most important archæological enterprise since Schliemann's, it has been carried out in a far more scientific spirit. The article is a learned and lucid summary of the main conclusions to be derived, or considered to be derivable, from the study of the work un-earthed at Knossos; and no better expounder of the subject could be found than Mr. Hogarth, unless it were Dr. Evans himself. But while it is unquestionable that his brilliant discovery has thrown quite a new light on early archæology, not exactly Greek, but related to Greek development, we confess that we are disposed to take *cum grano* the complete historic scheme of earlier and later periods of "Minoan art," as it is now called, which has been formulated on the basis of fragmentary remains of art from one large building. Practical archæologists and explorers, writing on these subjects in general periodicals, have things all their own way, for whatever conclusions they have come to cannot be refuted except by one of the small handful of people who have personally gone into the subject in the same manner. But those who have more or less to take statements on trust may certainly be allowed to think that, granting all the actual facts to be correct, too much is built on them and too great a demand made on our faith. And the artistic optimism of explorers is so remarkable. As in Mr. Hogarth's article, so in nearly every archæologist's description, the words "beauty" and "beautiful" dance before our eyes incessantly. Every jar that has a bit of pattern on it is "beautiful," and the fragments of painting and sculpture are spoken of as if they rivalled the work of the great period of Greek art. Now, we paid most careful attention to the Knossos exhibition at Burlington House some little time ago, but we saw little that was beautiful, though much that was interesting; as to the wasp-waisted figures with (apparently) metal rings round them, they are simply hideous. The historical interest of such a find is surely enough, without trying to persuade us, against the evidence of our senses, that a great art period has been un-earthed. The same number contains an article by Mr. R. E. Fry on "French Painting in the Middle Ages," really an article on, or suggested by, the recent exhibition of the French "Primitifs" at Paris. Mr. Fry is very well up in his subject, and has many suggestions to make in regard to the art-history of the period; but one almost requires a series of engravings or photographs of the works to follow the writer. The article will be interesting chiefly to those who visited the "Primitifs" exhibition. There is a suggestion, however, in regard to the relative value of mediæval symbolical painting and modern realistic art which is rather startling:

"We are now so familiar with the view that painting must follow the laws of natural appearance that it is hard for us to realise how little in the year 1400 that necessity was apparent, how contradictory even it may have appeared to the essential aims of pictorial expression. Let us take two examples of the conceptual and the phenomenal theories of design. One is a diamond-shaped pane of glass in Chartres Cathedral whereon a hunting scene is depicted. The huntsmen, on whom are concentrated our imaginative sympathies, fill the left-hand angle of the diamond and extend across the centre of the pane; up the right-hand lower border run two stags, whose antlered heads fill the space between the horses' fore-legs and noses; while the space between the horses' fore and hind legs is filled with the pack of hounds. Here we have condensed into the smallest possible space the elements of the chase that appeal most to the imagination; and the appeal is made by the sympathetic and keen observation, the dramatic fitness, of every line. To the artist who drew it and the public which enjoyed it, the criticism that these images do not bear the same relations as they do in three-dimensional space would have appeared impertinent. Our other example shall be a faithful picture of a modern battlefield: a wide undulating stretch of country broken by tufts of bushes and stones, here the almost indistinguishable accent of dark which tells of a soldier half hidden in the scrub, there the puff of dust which tells of a bullet striking the earth. There is absolutely nothing in such a scene whereby the artist can symbolise for us the intensest and wildest passions of the human spirit. Our thirteenth-century artist might complain that we have imposed limitations on our art which, in certain circumstances, reduce it to complete impotence."

That is ingenious, but we think fantastic; and besides, the comparison is hardly fairly made between a mediæval scene filled (in however conventional a manner) with figures and animals in action, and one in which hardly any figures are to be seen. Sergent could paint modern field of battle scenes that held one breathless with interest; witness his "Napoléon at Marengo."

The *Burlington Magazine* devotes an article to the subject of the Sheffield plate in Lady Wolseley's collection. The article is written by Mr. Spink, who gives a description of the manner in which the process, invented by G. T. Bolsover in 1742, is carried out; the substance of the Sheffield plate being produced by rolling together a sheet of copper with a thinner one of silver. The technical description of the process in all its details is very fully given, and is of considerable interest. The illustrations of examples from the collection referred to, though not all of equal merit, are many of them most artistic and beautiful work. The notes on Mr. Blackborne's collection of lace are continued, the present article dealing with Rose Point lace, of which some perfectly fascinating illustrations are given, of course not so architectural in design as the example in the last article, reproduced in our issue of October 22 (page 417 *ante*). In an article on the new Titian at the National Gallery, called a portrait of Ariosto (a reproduction of which forms the frontispiece to the number), Mr. Roger Fry shows, we think, very good reason, by reproductions of medallion heads of Ariosto, to conclude that if the picture is Titian's, in which we see no improbability, the portrait is not that of Ariosto. One rather wishes it were, it seems to accord so well with one's conception of the author of the "Orlando Furioso." A writer signing himself "P. A." makes a curious attempt to provide a kind of rule for answering the question "What Modern Pictures are worth Collecting?" The perfect artist is supposed to present five qualities in equal degree—Strength, Design, Insight, Drawing, and Colour; to each of which 6 marks, so to speak, are allotted. So that if the buyer find his proposed purchase is not up to 6 in any of these qualities, or only in one, and is as low as 2 in Insight and 1 in Strength, then we suppose he will say, with Browning's "Mr. Sludge, the Medium"—

"I'm warned—I let the trick alone this time."

The misfortune is that there is no real criterion for either Strength or Insight, and hardly for Design; it comes to a matter, after all, of perception, not of rule; and the perception may as well be applied at once to the picture as a whole. These attempted mathematical estimates of qualities of art are perfectly useless for any practical purpose, though they may be amusing in a speculative sense.

In *Technics* several serial articles are continued. Part II. of "The Mechanics of Heavy Electric Traction" is largely occupied with speed, distance, and time curves for various accelerations, and explanatory notes relating to the diagrams. Mr. J. B. C. Kershaw, in Part V. of "Electro-chemical and Electro-metallurgical Industries," describes the manner in which the electric furnace is applied in the production of calcium carbide, carborundum, artificial graphite, glass, and iron alloys. Professor J. A. Fleming, in Part IV. of "Electric Waves," directs attention to various devices suggested or employed for detecting the presence of an electric wave, and for utilising it telegraphically. Mr. Ibbotson discusses the analysis of steel alloys and the determination of minor constituents of high-speed steels. Mr. Edser continues his simple explanation of "The Electro-Magnetic Theory," and Mr. E. Fiander Etchells contributes a further instalment on the "Theory of Structural Design," devoting attention to steel pillar design. His suggestion for the construction of a diagram of working loads will be found useful, and his enumeration of special points for the consideration of the student is good. The writer is not wise, however, to designate the well-known radius of gyration as the radius of "equivalence." There is really no sense in departing from standard nomenclature, and the practice only tends to confuse students. A short article on "Colour Photography," by Mr. Colin N. Bennett, gives an interesting account of the three-colour process, first demonstrated in 1861 by Mr. Clerk Maxwell, and briefly describes a recent method by which a colour-photograph may be obtained on paper. The latter represents the last step of progress in this direction, but, as the writer says, a wide field remains for further serious work. An illustrated paragraph on "A Roller Attachment for T Squares" should interest our readers. "The Future of Electric Heating" is the title of an article by Mr. Edwin Edser, in which the writer, while admitting that the chief drawback to the electrical production of heat is the low thermal efficiency of the process, argues that the convenience and perfect control of the electrical heater often counteracts the initial disadvantage. We fully agree with many of his contentions, but the general application of electric heating must largely depend upon a very considerable reduction in the existing cost of current.

The *World's Work* contains a long article by the writer who signs himself "Home Counties" on the at present much vexed question of "Cheap Country Cottages." There are many illustrations, some of them of considerable practical and picturesque interest. The groups of three four-roomed cottages under one roof, on Mr. Clough's estate, look very well and provide rooms of a fair size, at 110*l.* per dwelling; but the sanitary provisions are not shown, and must form a small separate building, perhaps grouped to serve for several blocks; this must be a distinct addition to the expense. The Calway cement slab cottages are very ugly, and we fear the attempt at "artistic treatment of corrugated iron," by having a green trellis and creepers over it, does not do much to mitigate the case; one feels, in fact, sorry for the creepers. The article is an interesting one, however, and may suggest new and practicable ideas to some landowners who wish to improve the housing of their tenants on an economical basis. The same number contains an interesting article on "Dispelling Fog by Electricity." A clear description is given of Sir Oliver Lodge's experiments, and it is pointed out that the invention of the mercury vapour rectifier by Mr. Cooper Hewitt has made it possible to do these experiments on a commercial scale. At

the present time experiments are being carried out by Sir Oliver Lodge at Birmingham University. It is suggested that shipping and railway companies should experiment with fog-dispelling apparatus. It would be perfectly feasible to disperse the fog round railway stations and in the neighbourhood of signals. It would also be possible to keep all the space within fifty yards of a ship clear of fog. We consider that the problem is one that will repay serious study.

EGYPT EXPLORATION FUND.

THE eighteenth ordinary general meeting of this fund was held on Friday at Burlington House, W., by permission of the President and Council of the Royal Society.

The President, Sir John Evans, K.C.B., occupied the chair.

The Hon. Treasurer (Mr. H. Grueber) read his financial statement, which he said was the most unfavourable he had yet had to deal with. There had been a heavy expenditure, which had not been met by commensurate receipts, not only in the case of the Fund proper, but also in each of the branches—the Archæological Survey and the Græco-Roman Branch. It was, however, on the Exploration Fund that the blow had chiefly fallen, and this had arisen from two causes—the necessity of sending out two expeditions and the diminution of receipts from America. The general balance-sheet showed that this year the assets of the Fund and its branches amounted to 3,061*l.*, against 4,914*l.* last year. At the present market price the invested capital of the Fund would only realise about 1,830*l.*, so that the assets of the Fund stand at present at about only 1,653*l.*

On the motion of Sir H. Smyth, seconded by Dr. Redpath, the report was adopted.

The Chairman, in the course of his annual address, expressed his regret that the financial position with regard to the undertaking of further excavations was in so unsatisfactory a character, and that the relations with their fellow workers and former well-wishers in the United States were so far from what they desired them to be. He hoped an appeal shortly to be issued would meet with liberal support, for they were in honour bound to renew their explorations at Deir-el-Bahari and to organise an expedition in which Professor Flinders Petrie might carry on his fruitful researches, not improbably this season, in a new field. The Chairman proceeded to deal with the work done by Professor Petrie on the site of the ancient Herakleopolis, some 60 miles south of Cairo, and that at Thebes by Dr. Edouard Naville and Mr. H. R. Hall. Referring to the construction of the mighty dam across the Nile at Assouan, which seemed destined to bring about a state of affairs in the Valley of the Nile above Assouan which archæologists could not contemplate without a feeling somewhat akin to dismay, they must heartily deplore the deeper immersion of the lovely temples at Philæ and the probable effects on those of Kalabshah and even Dakkeh; but it was to be feared that all they could do was to make the strongest representations in their power to the Egyptian Government in order that they might take all possible precautions for the preservation of such monuments as lie within the area of the extended reservoir, and submit themselves with what grace they could to this application of the old-world maxim, *Salus populi suprema lex.*

Professor Petrie, in the course of his address said: "Last winter we found that we were limited to work at Ehnasya, about sixty miles south of Cairo. The attempts that we have made to be allowed to complete the history of the early Dynasties at Saqqara have been fruitless; and English work is still prohibited there under any conditions. To sit down to a site which had been abandoned as exhausted, after Dr. Naville's work at Ahnas or Ehnasya, was by no means tempting, but we had to make the best of it. Some of the results you have seen this summer in London. The temple site was cleared to the bottom, and over about three times the area of the former work. Four temples were shown to have successively occupied the ground from the XIIth Dynasty to the Roman times. Historically, the important point was settled that Antef V. and a 'king of the Aamu,' or Syrians, had ruled before the XIIth Dynasty. And as regards objects we found the largest triad of granite that is known, a colossal group of Rameses II. and two gods, 11½ ft. high, and also the beautiful gold statuette dedicated by the king of this province about 730 B.C. This is one of the finest gold statuettes known, and it was most satisfactory that the workmen fetched one of our party to take it from the undisturbed ground himself, so that every detail of its discovery is completely known. Two large gold octadrachms of Arsinoe were also found by another man, and almost every year we obtain gold work; while from excavations where no *bakhshish* is given gold is scarcely ever obtained. We have thus secured not only the history of the place, but two antiquities which, in their respective classes, are the finest known.

"In later antiquities we have made a collection of Roman lamps, from which a *corpus* will be published of photographs of more than a thousand in systematic arrangement. And the Roman terra-cotta figures have been accurately dated, and a large collection will be systematically published. Both these subjects can now be studied in future from a fixed basis of classification and dating.

"While waiting for the possibility of working more of the great historical problems—which can only be solved by very few sites in Egypt, all at present unattainable—the best prospect of important results seems to lie in the complete examination of Sinai. The mines were worked there from the Ist to the XXth Dynasty, and nearly 150 inscriptions are already known; as every explorer has recorded much which no one else has seen, it is probable that many more inscriptions exist. We hope to completely copy all of these in full size facsimiles and publish them next year. The questions about the mines have never been settled; whether they were for turquoise or for copper, or both together, is quite undetermined. Not a single plan of the positions or form of the mines has been made, and the whole of the mineralogy has still to be cleared up. If a permission to excavate is granted to the Fund, we hope to search the remains of the miners' settlements and their waste heaps from the Ist Dynasty downward. And later than all these Egyptian interests there are the various early Christian settlements in the peninsula, which all need planning and examination, entirely apart from the one convent which is now inhabited.

"A necessary foundation for this research in the eastern part of Egypt has been laid by the work of Captain R. Weill, who has just published an account of all the Egyptian inscriptions there, which is as complete as the various present copies allow. Such has been a laborious research, and very needful before doing fresh work there. These copies annotated by scholars will serve as a check on our work, and will show on the spot how much is already known. All the more we see the need of complete facsimiles to form a final publication. After we had formed our plans M. Weill offered to join our party at Suez and assist in our work, in which his knowledge will be of great value. We expect to form a party of about half a dozen copyists, and to have over a selection of my old diggers from Egypt. With such a party, and four months of steady work, I hope that we shall know a great deal more than has resulted from the hasty journeys of isolated travellers.

"This district has also great importance in view of the many questions of early Israelite history; and recently the later Jewish history has been much criticised by introducing a supposed independent kingdom of Muzri in this region, apart from the Egyptian Muzri. I fail to see that any allusions to Muzri in the historical books are not completely applicable to the Egyptian territory of Sinai, but any fresh light on the Egyptian occupation here in the later Dynasties will further strengthen such a conclusion. We have then before us for this winter a certainty of much solid work in the Egyptian frontier history and ancient mining, a fair chance of more light on the early Dynasties, and possibly some further illustration of the Jewish times.

"To return to Egypt. The serious question for us is how soon the great interest felt in such work, which has been so largely supported by the public, can lead to the remaining problems of the country being opened to our research; how soon the supremacy of Mammon in the management of that land may leave a little opening for the higher interests of thought, how soon political intrigue may cease to hinder scientific investigation. Although we do not ask for public money, which is so freely given by other governments for such work, we must all strive to obtain for England liberty of research."

Dr. Bernard P. Grenfell also addressed the meeting, and said that the third season's excavations at Oxyrhynchus began on December 4, 1903, and lasted three months, and though they had not any fresh sayings of Jesus to announce, they proved quite successful. One mound in particular yielded a rich harvest of papyri of the first four centuries of our era, amongst which are numerous literary fragments, while another fourth to fifth century mound produced some theological pieces. In the extreme north of the town, where they were digging towards the end of the time, the papyrus-yielding layers ran as deep as 25 ft., so that the progress of the trenches was slow, and much remained to be done this winter in that part of the site. The papyri had as usual all been sent to Oxford for publication, pending a division with the Cairo Museum later. Dr. Hunt and he had not, however, been able to examine them this summer, since they had devoted most of that to beginning the formidable task of unrolling their large collection of papyrus cartonnage from Ptolemaic mummies found between 1900 and 1903, together with the second collection of mummied crocodiles wrapped in papyrus rolls found in the Fayûm in 1902. While the Oxyrhynchus papyri, which were packed between layers of paper inside tin boxes, would keep dry for an indefinite period without being unrolled, the cartonnage and papyri from crocodiles not only are much more fragile to start with, but had to be packed in cotton wool—a substance which attracted and retained damp—so that they could not be expected exactly to improve their condition in an English climate. Not that those which they had brought back had suffered at all so far by being kept, but it is certainly not advisable that they should continue longer than is necessary without being unrolled. The Hibeh papyri had quite come up to their expectations. A special feature of these fragments from Hibeh were their great literary antiquity. Dr. Hunt and he left in a fortnight for Egypt, and the excavations at Oxyrhynchus will be resumed early in December, it may be for the last time. Not that they could possibly hope to finish excavating the site on the scale which it has the right to claim after all that it has yielded. They might indeed, perhaps, hope to finish those portions in which papyri of the Roman period were found close to the surface, and which were, therefore, the most profitable. But the mounds of the Byzantine period were worth clearing away systematically for the sake of finding theological pieces, apart from the chance of finding earlier documents in the lower levels. Unfortunately, the income of the Græco-Roman Branch, at no time large, threatened to be insufficient for providing an annual expedition in addition to the annual volumes which they were pledged to publish, and after the coming winter the cessation of work in Egypt may for a time at anyrate be necessary. While no one would regret this more than Dr. Hunt and himself, if they were compelled to stop in the middle of what had been a fairly consistent tide of success, especially when there are so many rivals in the field, and the number of good sites was rapidly diminishing, they would have the satisfaction of knowing that they had done their best to avoid such a result.

On the motion of Judge Baylis, seconded by Mr. Cotton, a vote of thanks was passed to the chairman for presiding.

TRINITY CHURCH, SALFORD.—In their Bill which they will introduce during the next Session of Parliament for effecting an enlargement of Exchange Station, Manchester, the London and North-Western Railway schedule the site of the Church of Holy Trinity, Salford. The church, in Chapel-street, was first erected in 1635, with a capacity for 800 persons; it was rebuilt after the Grecian Doric style, in 1752, and on two subsequent occasions has been repaired and restored. The church was built by Humphrey Booth, in whose descendant the patronage still vests, as a chapel-of-ease to the then parish church of Manchester; it is the oldest church in the borough, and possesses many historical and local associations. Strenuous opposition to its demolition is expected.

NEW PULPIT, PARISH CHURCH, WESTON-SUPER-MARE.—A pulpit has been placed in the parish church of St. John the Baptist, Weston-super-Mare, as a memorial to the victims of the fire with which the town was visited in May last. The pulpit, which is of Caen stone, enriched with polished marbles and alabaster, is nearly 8½ ft. in height. The work was carried out by Messrs. Harry Hems & Sons, of Exeter.

ECONOMIES OF CONSTRUCTION IN SMALL HOUSES.*

THE term "small houses," I have considered, includes cottages, entrance lodges, houses detached, semi-detached, and houses built in rows. The subject, therefore, I have found too vast to do more than make general suggestions upon, and I beg you to forgive me if I do not satisfy your expectations. I am not at all sure, too, that I shall be able to suggest sufficient points of economy, for I will not, if I can help it, sacrifice quality for cheapness, but rather suggest that economies be obtained by adopting *simplicity* as the principle.

The aim, then, is economies. The subject, small houses, including cottages, entrance lodges, houses detached, semi-detached, and houses built in rows.

The details will be:—(1) Site, (2) Aspect, (3) Special requirements, (4) Size and number of rooms, (5) Plan, (6) Elevation, (7) Materials, (8) Sanitary arrangements and drains, (9) Decoration, (10) Cost, (11) Builders.

(1) *Site.*—Both for cottages, as well as for houses in a row, if possible, the site should be on fairly level ground, else the foundations will run up the cost of the building.

(2) *Aspect.*—Though this has little to do with economy, aspect should be considered even in cottages, the south or south-east being the best, and moderately near trees for protection from winds, and these often afford pretty views towards which the living-rooms can be arranged to have their windows looking.

If the house is one in a row you may not have a choice of a site, and must then arrange your best rooms to have the best aspect you can give them.

(3) *Special Requirements.*—Even a cottage may have its special requirements as one at Hollingbourne had, which I shall presently quote. It was for a man and his wife who did the laundry work of a mansion, and, therefore, a special wash-house was needed which was put at the back with a lantern-light over to let out the steam.

Generally speaking, a cottage or small house is required and built for the working class, viz., a man and his wife with or without a family.

(4) *Size and Number of Rooms.*—Cottages and very small houses for the working class in the country are provided with about six rooms.

In London and suburbs the small houses are divided up into separate tenements, each floor containing three or four rooms as a separate tenement, viz., sitting-room, kitchen, and two bedrooms, and sometimes a separate water-closet on each floor, while on the ground floor at the back will be a wash-house for the use of all the tenants.

The general run of the speculative builder's house in the suburbs of this great Metropolis, let at about 40*l.*, will contain about seven rooms with a bathroom and water-closet often combined in one room. (But the number of rooms will depend, I suppose, as the song has it, upon "Matilda and the builder, and the childer.") This bathroom is a perfect boon to those who like washing in these days, and I really believe it is more done now than, say, thirty years ago, when you could not get a bathroom in a small house, no, nor yet in a large house. These accommodations, I believe, draw people's attention, and prevent them from looking into the construction and beauty, of which there is often little or none.

For size of rooms, I think, no sitting-room should be less than about 100 sq. ft., or bedroom than 80 sq. ft., and 9 ft. high for ground floor, and 8 ft. for first floor, but they are, I know, built of less height. The 8 ft. for first floor may for half the area of the room be in the roof, and this saves waste of room. Mr. Bateman, in his most interesting paper on this subject in *The Builder* of March, 1900, gives 8 ft. 6 in. height for ground as well as first floor.

(5) *Plan.*—(1) For *small houses* of the speculative builder's type I show a plan of some houses in Fitzalan-street, Lambeth, which I have borrowed. It is for a row of houses for the working class, three stories high, let out by the floor of three rooms and a water-closet, with a wash-house on the ground floor at the back for the use of all the tenants.

Cottages and lodges give more scope for skill in planning. Generally speaking, there is no doubt that the cheapest form of plan is a square or oblong under one roof, with only one chimney stack if possible.

(2) The "But and Ben," or workman's cottage, by Mr. R. Norman Shaw, R.A., as illustrated in the *Building News* in 1878, is really an oblong plan under one roof. This, as the name implies, is a two-roomed cottage, with the clever arrangement of recesses for the beds,* and only one stack.

(3) Cottages at Hollingbourne, Kent, was for the laundry woman and her husband, who did the washing for the mansion close by, and thus a special wash-house was required. It is a six-roomed cottage, and one of the objects I kept in view was to have, if possible, a fireplace in every room, yet only one stack. One bedroom, however, is without a fireplace, although there *is* only one stack. The wash-house is put at the back.

(4) For entrance lodges I give three sets of drawings. First, one of the entrance lodge to Steyne House, Bembridge, in the Isle of Wight, for Sir John Thornycroft, by my brother, Mr. John Belcher. This is a four-roomed lodge, two stories high, with one stack, and has a wash-house and water-closet at the back. It was not, however, so far as I know, built on the cheapest method.

(5) One of the *cheapest* lodges I know is the entrance lodge at Amersham, Buckinghamshire, by Mr. T. P. Figgis (see lithograph plate). This is really a four-roomed lodge, with store-room on first floor, and wash-house at side. It is designed on the square-plan principle with hipped roof all round and one stack in the centre.

(6) I would refer you also to Mr. Maurice B. Adams's book on "Modern Cottage Architecture" recently published. He gives many and varied examples of lodges and houses, of eminent men, and the suggestions he makes are most useful. I will just quote one or two.

Plate XXII. is a lodge at Leamington, by Mr. Briggs, one story high, with four rooms and one stack, but you have to pass through one room to get to the others.

Plate XXXII. is a gardener's cottage at Great Warley, Essex, by our President, Mr. E. Guy Dawber (see lithograph and Fig. 1). This is two stories high, and has six rooms and one stack and is built with red bricks and tiles. It is to me an excellent example of beauty in simplicity of design obtained by proportion of solids and voids.

I also give another example, by Mr. E. Guy Dawber, of two entrance lodges in one, near Moreton-in-Marsh, which he has kindly lent me. These are built in stone, being in the stone county of Gloucestershire. Each are two stories high and contain five rooms, and they have one stack between them. In these again the simplicity of their design is their charm—nothing is introduced but what is wanted for use. The stack, I presume, is built in brick because it bonds better than the rubble work. There are some interesting details of these lodges.

Next is a clever plan for a cottage at Northolt, by Mr. Arnold Mitchell (Fig. 2).

Plate XXXIX. I mention here, though it belongs to a larger type. It is called Cottage

* A paper read before the Discussion Section of the Architectural Association, on Nov. 2, by Mr. A. H. Belcher, A.R.I.B.A. A short abstract of the paper has already appeared in our pages, but as since then Mr. Belcher has sent us some of his illustrations, and as the subject is of considerable practical interest, we give the paper so far as it can be given without the full number of illustrations, which were constantly referred to.

* We consider, however, that these beds in recesses are *most* unhealthy, and should never be adopted.—ED.

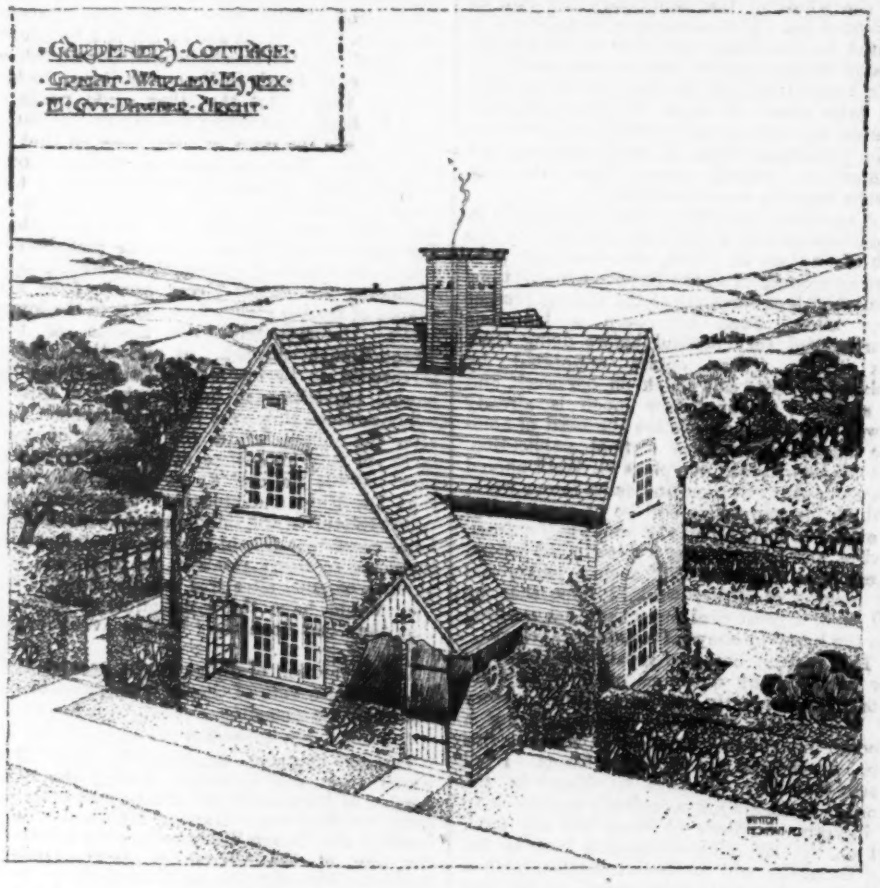


Fig. 1.

at Medmenham, by Mr. Arnold Mitchell, and is on the quadrangle plan. It is really a nine-roomed house, but is very simple and nice and works well.

Plate XLII. is a house at Royston, by my brother, two storied with eight rooms, and has a porch.

Of groups of cottages I will just quote the following:—

Those at Chislehurst, by Messrs. Ernest George and Peto, 1878; three storied, five rooms, and looks somewhat expensive. Those at Pinner by the same architects in 1879. Those at Midhurst by the late Mr. Ernest C. Lee in 1878. Those by Mr. R. Norman Shaw in 1878.

A group of four cottages at Hidcote, in Gloucestershire, by Mr. E. Guy Dawber. These work out exceedingly well both in plan, elevation, and grouping, although they do have five stacks to the four cottages.

Then there are those by the Elementary Class of Design, illustrated in *A. A. Notes* for August this year, to be built in stone. But these have six stacks between three cottages.

Lastly, I quote a good example of a pair of cottages at Trashurst by Mr. W. Curtis Green, under one roof. These are very simple in plan and were very cheap though well built.

Then there is the question of almshouses, often built in the form of a quadrangle, but as these generally include other buildings, such as a chapel, they are really outside the scope of this paper.

For middle-class houses in a row I might quote those at Turnham Green by Mr. R. Norman Shaw in 1878—three stories high, with nine rooms, and simple elevation.

For single houses of a larger type there is a good example of one at Buckhurst Hill by Mr. A. Needham Wilson, simple in plan and elevation, and which was built very cheaply.

Mr. E. Guy Dawber has also lent me his drawings for a house at Hampstead. It is really three stories high with eight rooms, built with red bricks and red tiled roof, and is very compact, although it has a spacious hall. There are some interesting details of this.

(6) *Elevation.*—Much might be said on this head, but I do not believe in laying down any hard-and-fast rule, except that I venture to think *simplicity*, if worked out in accordance with the requirements of the cottage or small house to be designed, and taking the materials most easily obtained in the neighbourhood, is the right principle to adopt.

If only the speculative builder of small houses would believe this, and would at least obtain the assistance of an architect who devotes his life to the study of the subject, we should not see half the heaps of rubbish and mortar piled up on either side of the new roads constantly opened up in the suburbs of this great Metropolis. Walls are run up, broken with bay windows (for every house must have a bay window). These are faced with red bricks, which they often colour pink and then point with black tuck pointing. A brick apron is put under the windows cut to fantastic shapes. String courses of terra-cotta are built in across the front and enriched, at so much a yard run, and terra paterae, and panels are introduced to fill up any spaces that are left. Some houses with bays have the angle mullions in stone, with carved caps of realistic foliage which they call Gothic, a small moulding half way down, and a moulded base, while the edges in between are all stop chamfered. Then a pediment will be put over the entrance door, with carved scrolls in the tympanum of a Classic type. The door itself is heavy bolection moulded, highly grained and varnished, and the upper panels glazed with a kaleidsocope of stained glass of all the colours of the rainbow. Green slates cover the roof, purple slate ridging finish the hips of the bay, while red tile cresting crowns the roof. I won't weary you with any more details; you know them only too well. But for all these fancies, which every one can see, the speculative builder has to scant his timber construction and anything else that you cannot see. In all this, simplicity is sacrificed for a false show. I feel constrained to add, in the words of Shakespeare, "Therefore, thou gaudy red, I will have none of thee."

The speculative builder, of course, says he cannot afford to employ an architect, and I have almost wondered if our Advanced Class of Design could not be set to design a simple suburban house which might be offered to some speculating builder for a small fee, sooner than see some of the monstrosities that are put up.

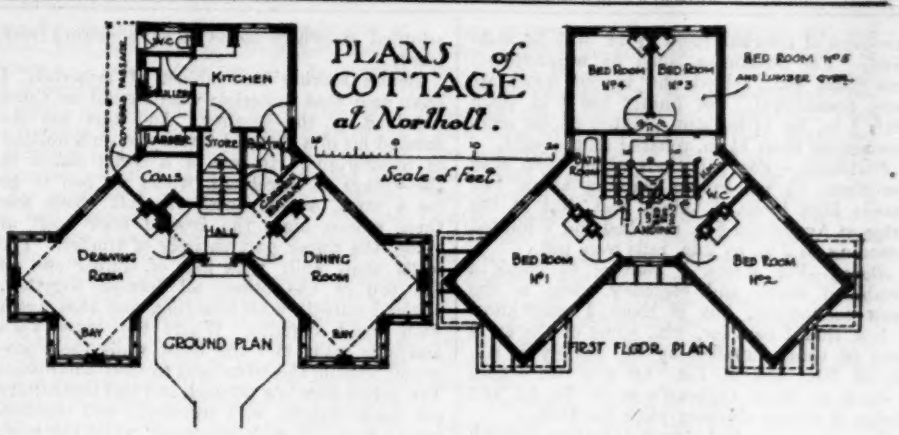


Fig. 2.

Well, if anything can be done, let us remember the principle of simplicity, for the builder often thinks an architect's design costs more money.

(7) *Materials.*—This, perhaps, is the crux of the subject, and a difficult one.

First, as to cottages in the country, materials must be governed by the locality, and I suggest using only those that can be readily obtained.

In the clay counties bricks are to hand, in counties like Somersetshire stone is cheaper, in Norfolk flint stones are used. When using bricks, local red facings often look very nice in colour and can be used.

If tiles are ready to hand you can use them above the ground floor for weather tiling as well as for the roof. Those for the cottage at Hollingbourne were made about half a mile away. It is true they cost a little more than red facings, but not more than about 2d. a foot super, and if you use them you can build your walls behind them with brick on edge in mortar as sketch (Fig. 3). I would add, do not use Broseley tiles if you can help it, they are expensive.

If tiles are not to hand rough cast may be used instead of weather tiling, as that is about the same price or even cheaper than facings. For rough cast Mr. Wilson informs me the walls of the house at Buckhurst Hill were built with grizzles, and the rough cast was a rendering in Portland cement, finished with rough cast made with clean coarse grit mixed with blue lias lime putty and thrown on with a trowel.

At the lodge at Amersham by Mr. Figgis the external walls were 11 in. hollow walling formed with two half brick walls in cement with a 2 in. cavity between and bonded together with galvanised iron twisted ties with clawed ends, three ties to each yard super, and this cost 1s. 3d. foot super.

For damp course in the country slates are the cheapest and are quite effectual.

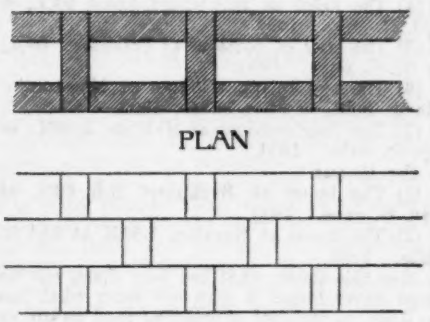


Fig. 3.

For roofs slates are cheaper than tiles, the former being about 30s. a square and the latter about 45s., but slates do not look nice in a clay district. In either case I think rough boarding should be used under them, but ¼ in., or rather, I would say, ⅜ in., will do. Felt may be given up, it costs 9d a yard super. Where tiling is used I think nothing looks nicer than half round ridge tiles for the ridge.

For flashings, I think far better be safe and use lead—zinc is poor, and cement filletings crack often with the frost.

Thatched roofs I confess I know nothing about; perhaps someone present can enlighten me on the subject.

Half round eaves gutters I think look better and are cheaper than moulded, and round R. W. pipes I think better and cheaper than square.

Floors.—For ground floors, if you have not much top soil to take off, you can put a bed of 4 in. cement concrete floated in cement, with a 1¼ in. deal wood block floor on top. This was done in the lodge at Amersham.

But cheaper than this would be to bed 4 in by 3 in. plates as joists splayed two edges in the concrete bed and a 1 in. floor nailed on to this. This was done at the cottages at Trashurst by Mr. Curtis Green.

If you have to take off as much as 12 in. or more, then the usual method seems the best one to adopt, viz.—a bed of 4 in. concrete, half brick sleeper walls built honeycomb, 4 in. by 3 in. plates, 5 in. by 2 in. ground joists, and 1 in. flooring. And this is cheaper than the wood block flooring, I think, by about 7d. a foot super.

For sculleries and wash-houses a concrete bed floated with ¾ in. neat cement is the cheapest and cleanest.

For first floor, if you have not much funds joists and flooring only can be used, and lime-white the underside.

Finishings to Walls.—Some would adopt two-coat plaster, but this I think risky. I don't think you can give up the "render, float, and set" for living and bed rooms.

For a wash-house pointing and limewhite is the best, and if you have the room partly in a roof, and funds will permit, put ½ in. matched boarding on the roof timbers. Plaster will not do—it will come down with the steam.

Windows.—Double hung sashes are generally cheaper than casements and frames, but do not look so nice. If you use casements and frames, in cottages I think 4 in. by 3 in. will do for frames and 1¼ in. casements, and I think such labours as splay-rebated bottom-rails and hollow grooves to styles should be given up, they all cost 1d. foot run. But sash bars always look nice and do not cost more than 1d. foot super over casets in one square.

For ironmongery I would not choose quite the cheapest, as it is often inferior, but for a cottage japanned iron will do, in fact while the war is on it ought to be the rage. For reveals plain plaster will be found cheaper than wood linings and architrave.

Where casements and frames are in weather tiling or rough cast, stone cills are not required, as the frame is best flush with the tiling or rough cast and the oak cill made about 2 in. wider.

In London you cannot project timber beyond the external face of the wall, but if you wish to finish the head and sill of your frame with a moulding it *can* be done in *oak* if you make application to the L.C.C.

If your frame is in rough cast you can finish the head and sill with a course or two courses of tiles fixed sloping and no application is needed for this.

Where your frame has mullions, and is flush with the external face of brickwork you can finish the top with flush brick on edge, and this saves arches and cuttings.

Doors.—For cottages, if you use panel doors, I think square framed quite sufficient and look well; and do not put large panels, else you must specify the thickness, or the builder may use thin wood and the panel will split. For general

thickness of internal doors 1¼ in. will be sufficient. For outhouses, such as water-closets and coals, etc., ledged and braced doors are more economical. For linings use 1 in. plain with ¼ in. by 1¼ in. stop planted on, as more economical than 1¼ in. rebated on the solid.

Partitions.—For partitions other than stud partitions 1¼ in. square framing about two panels high looks, I think, best, but at the lodge at Amersham ¾ in. matched and V-jointed boarding on 3 in. by 2 in. rails were put.

Stoves.—For stoves I venture to think a combined stove and chimney piece is the most economical, but of these I only know a few that I care for, viz., some of the early ones of those supplied by Mr. Elsley at p.c. 2*l.*, 2*l.* 10*s.*, and 2*l.* 15*s.* Or you can obtain a stove at Bratt Colbran's at 1*l.* 7*s.* 6*d.* and design a simple chimney-piece for that.

Ranges can be had almost anywhere, though none that are safe under 5*l.*

(8) *Decoration.*—Under this heading I take painting and papering. For painting in my humble opinion there is nothing to beat plain ivory white throughout for economy, effect, and cheerfulness. The only thing I know against it in cottages is that finger marks will show on the doors where they are opened. Well, then, I would say paint black finger plates on the doors.

Of course, the front door can have a choice colour for effect, and I do not think it necessary to add, do not do as the speculative builder and grain to imitate oak or any other wood which it is *not;* it would be a lie, and for Ruskin's sake give it up.

Mr. Maurice B. Adams in his book mentions a useful point, viz.—the tarring the inside of eaves gutters, instead of painting; it lasts longer.

Papering is far better left for six months till the walls are thoroughly dry, but if anything is required I think plain coloured lining paper is best and looks best, and even brown paper. But do not use blues, as these are sure to fly and show patchy, and this applies also to papers with a pattern on.

(9) *Sanitary Arrangements and Drains.*—These you will have little choice over, as they will have to be carried out in accordance with the Regulations of the Urban District Council, whose regulations sometimes are often in my humble opinion very absurd; such, for instance, as separating the rain water from the soil drain where the rain is not stored for use.

The weights of pipes are regulated, generally by the water companies, and these pipes I think are best not covered up with pipe casings, as uncovered they are more easily accessible.

Closets I cannot suggest, their name is legion, and new ones continue to flood the market, but whichever you select, if you have the pan and trap in two pieces you can often replace the one if required without the other. And again, if you select a wash-down closet with a seat, choose those in hardwood, else the hinges will probably be poor and not last. They are now made without lids, and these appear to me to get over this difficulty.

If the cottage is a gardener's one, you can put an earth closet. I mention gardener's cottage, as other servants do not always keep them in order, and in that case they are not healthy. They were used at the cottages at Trashurst and Amersham.

As small suburban houses now generally have baths, why should not cottages? Mr. Maurice B. Adams in his book gives an ingenious device for one in the saving of room, by sinking it in the scullery floor and covering it over with a lid, which is stood upon after the bath is used.

In some places in the country the rain water is collected, and in this case an underground tank is built in brick, from which it is pumped up.

For drains, where the house is one in a row and they have to pass under it, iron pipe drains are best, as these have less joints, or stoneware encased entirely in concrete can be used with the usual gulleys outside, manhole next sewer, with air inlet pipe from same, and exit pipe at the highest end of drain for which the soil pipe can be used. When in the country a cesspool with overflow takes the place of the sewer.

Of course, there are a thousand and one little points I have not touched upon, which may be treated economically by adopting simplicity as the principle. For instance, if you wish to finish a certain spot with a moulding, use if possible the same moulding that has been adopted elsewhere so as to save cutting fresh irons.

Before leaving the subject of materials, I have said that materials used should be those obtained in the locality. And this has reminded me of a sketch I attempted on a holiday in Switzerland. It was of a Swiss chalet in the village of Engelberg, where we had to go for a week, as the hotel was full. This was three stories high, the ground floor built of stone, the upper part entirely of timber. The walls were built with logs of timber one on the top of the other, all framed together, covered outside with boarding, and that again with wood shingles. Where the cross walls and side walls met the front walls they projected outside the latter and formed buttresses. The gables were low pitched, and had beautifully cut barge boards, with pendants, and the balconies were cut with fret-work, while the roof, which had considerably overhanging eaves, was kept from being lifted by the wind with large stones placed on the top. Internally some of the floors were covered with parquet, and the ceilings panelled in wood. If you look at the rough sketch you will see all this perhaps better than I can describe it.

One other interesting arrangement which has been adopted nearer home, is that of some bungalows on the beach at Shoreham near Brighton. An artist cousin of mine had one built some years ago when there were only a few, now I am informed that there are over two hundred. The one my cousin had built was, I believe, illustrated in the *Strand Magazine.* The process is described briefly as follows:—Three railway coaches were purchased for from 10*l.* to 15*l.* These, according to the class purchased, consist of four or five compartments. One was first class, another second, and another third. They were raised on sleepers to the height required and placed in position as shown on sketch plan.

The centre space was divided up into dining and drawing rooms and roofed in. Some of the partitions were knocked out of the coaches to make good size bedrooms, the doors of same opening on to the sitting-rooms. Kitchen and other offices were formed at the corners and roofed in, the space from floor of coaches to the ground was boarded in, and when all was complete the whole was painted white to get rid of the look of the railway, and, *voilà,* you have your habitation, at a cost of from 150*l.* to 200*l.*, and, as far as I can tell, a nine-roomed house.

(10) *Cost.*—And now to return to cost. I can give the cost of some of the examples I have quoted as follows:—

For Cottages.

(1) The lodge at Amersham cost 225*l.*, or 6d. a foot cube. 1900.

(2) The gardener's cottage at Great Warley, 340*l.*, or 7¾d. ft. cube. 1903.

(3) The cottage at Hollingbourne, 475*l.*, or 10d. ft. cube. 1901.

(4) The lodge at Bembridge, about 400*l.*, or 10d. ft. cube. 1886.

(5) The pair of cottages at Trashurst, 660*l.*, or 6d. ft. cube. 1900.

(6) The two entrance lodges at Moreton-in-Marsh. 500*l.*, or 6½ ft. cube. 1903.

(7) The four cottages at Hidcote, 1,095*l.*, or 5¾d ft. cube. 1904.

For Houses.

(1) The house at Buckhurst Hill, 680*l.* at 6¾d. ft. cube. 1902.

(2) The house at Royston, 1,542*l.* at 6¼d ft. cube. 1893.

Now this shows what has been done, but we must never forget it may not show what can be done, as the cost of building may go up, or it may go down, and that point must always be borne in mind when considering the cost.

(11) *Builders.*—As to builders, of course small builders, especially country ones, build cheaply, but I always feel they are dangerous, as they are often men who have been in one trade only, and know little about the others, which they let out to piece work. And if they have been bricklayers they will probably not do good joinery, and you may have shrinkages and defects in this trade which everyone can see and grumble at. If you employ a fairly substantial builder the work may cost a little more but it is more likely to be well done throughout, and he will probably understand your details better. I therefore recommend this class of builders being invited to tender.

In conclusion, doubtless I have left many points untouched, and whatever I have missed for want of time, I suggest that the simplest method of doing things is generally the most economical, and the most truthful, and we come back to our old motto, "Design with beauty, build in truth."

THE ARCHITECTURAL ASSOCIATION.

An ordinary fortnightly meeting of this Association was held on Friday evening last week at the new premises of the Association, No. 18, Tufton-street, Westminster, S.W., Mr. E. Guy Dawber, President, in the chair.

Mr. Louis Ambler, hon. Secretary, having announced that Mr. E. M. Gibbs had been reinstated as a member, the following gentlemen were elected, *i.e.*, Messrs. Quittenten, J. A., Warlingham, Surrey; Sich, P. B. W., Chiswick; Napier, W. A., Camden-square, N.W.; Turmeau, A., Bow, E.; Chick, H. E., Tulse Hill; Thorp, R. W., Hampstead; Webber, S. J., Maidenhead; Kent, J. C., Hailsham, Sussex; Rogers, G. G., East Sheen, S.W.; Winship, B., London; Thomas, A. J., London; Woods, F., Maidenhead; Grant, T. F. W., Sittingbourne; Batalha-Reis, V. C., Notting Hill; Bateman, H. F., Harmondsworth; Boss, Albert H., Victoria Park, N.E.; Hipkins, F. W., London; Crawley Boevey, F. H., London; Boyle, E. A., Westminster; Aickmann, W. A., London, and Dahl, J. L. G., London.

The late Professor Kerr and Mr. Batsford.

The President said that since the last meeting they had to deplore the loss of Professor Kerr, one of the original founders of the Association, and their first President, in 1847. Professor Kerr was always a firm supporter of the Association, and its educational methods, having for fifty years taken the greatest interest in its work, and in 1897 he was present on the occasion of the Jubilee Dinner, although he was then a very old man. They all knew Professor Kerr's great books, and the interest he took in the affairs of the Royal Institute of British Architects, and he was sure the members would wish to pass a vote of condolence to the relatives of the deceased, and he moved accordingly.

The motion having been agreed to in silence,

The President said they had also lost a friend, to a certain extent, of the profession in Mr. Bradley T. Batsford. His firm had always been extremely kind to students and others in assisting them to get such books as they needed, and he believed that the members would desire that a letter of condolence be sent to Mr. Batsford's relatives in the sad loss they had sustained.

This motion was also agreed to in silence.

The Building Fund.

The President then announced that the following further donations had been made to the Building Fund, *i.e.*, Messrs. W. H. Lever, 21*l.*; Owen Fleming, 10*l.* 10*s.*; Wm. Willett. 10*l.* 10*s.*; E. Dru Drury, 5*l.* 5*s.*; Leslie W, Green, 3*l.* 3*s.*; A. H. Ryan Tenison, 3*l.* 3*s.*; F. W. Bedford, 2*l.* 2*s.*; H. Farquharson, 2*l.* 2*s.*; W. L. Grant, 2*l.* 2*s.*; Percy L. Marks, 2*l.* 2*s.*; George Frampton, R.A., 1*l.* 1*s.*; C. L. Hampton, 1*l.* 1*s.*; Geo. Hubbard, 1*l.* 1*s.*; and Arthur Keen, 1*l.* 1*s.*

Mr. Louis Ambler announced the following donation to the library: "The Architektonische Rundschau" (9 volumes); "Blätter für Kunsthandwerk" (3 volumes); presented by Mr. Edwin O. Sachs.

A vote of thanks was accorded to the donor.

Sir Aston Webb, R.A.

The President said they would all be in full agreement with what he had to propose, *i.e.*, that the most hearty congratulations of the Association should be sent to Sir Aston Webb upon the honour he had just received from His Majesty the King. Sir Aston Webb had been a consistent friend of the Association from early days, and he had been their hon. Secretary, vice-President, and President, and had always taken the warmest and kindliest interest in their affairs. When the gift of the new premises was being arranged with the Royal Architectural Museum, no one furthered the effort to make the matter a success more than Sir Aston Webb. That was not the occasion to speak of Sir Aston Webb's work; they all knew it well, but he could say that his urbanity, kindness, and willing advice and help to anybody who came in contact with him would endear him to all, and he was sure they would hope that Sir Aston Webb would long be spared to enjoy his honours.

The motion having been heartily agreed to,

Mr. W. Henman then read the following paper on

Ventilation.

The invitation which I received from the Architectural Association to address its members on the subject of "Ventilation" was accepted as a compliment and with somewhat of a light heart; but more recently I have been reminded by Mr. (now Sir) Aston Webb, R.A., that, like politics and religion, the subject of ventilation is apt to arouse passion and prejudice. This fact has recently been unpleasantly forced upon me to such an extent that I have had seriously to consider whether I could venture to face another audience and run the risk of exciting animosity in again dealing publicly with the subject.

To have withdrawn, however, might lead to the suggestion that I had not the courage of my convictions, or at least that I feared consideration and kindness might not be accorded to me by the members of this Association. Believing that truth and justice will eventually triumph in this as in other matters, and trusting in the good nature and reasonable spirit in which you will receive the few remarks which I have to make on this thorny subject, I have decided to brave the occasion, simply premising that it will be my endeavour, not so much to raise controversy as to stimulate observation, in the hope of extending sound views upon the principles involved and greater intelligence in their application.

Difficulties which confront one in dealing with the subject of ventilation arise from the fact that it principally relates to functions of life which, in their fulness, are practically beyond human comprehension, and because it has to deal with individual susceptibilities as well as with an invisible, elusive, and almost intangible body, viz., the atmosphere, affected by chemical and physical laws, but yet only partially understood. Literature on ventilation is somewhat profuse, and many eminent scientists have investigated various phases of the subject, yet it appears to me there is still an opening for a concise treatise which will deal with it in a scientifically practical and up-to-date manner, without prejudice, to serve as a text-book for architectural students. Under limitations imposed upon me by the Editor, I wrote an article some three or four years past which appeared in a publication called "Modern House Construction," which, in some respects, deals with details it would be tedious to repeat in an evening's paper, although in substance I must place before you the same conclusions as those dealt with in that article and drawn from my own practical experience.

Perhaps the most unfortunate circumstance in connexion with ventilation results from the fact that eminent early writers thereon, whose works are still largely resorted to, make assertions from their undoubtedly careful observations which, in face of more modern practice and the great improvements which have since been effected in appliances, cannot now be accepted.

One of the best standard works is that by Dr. D. B. Reid, who for some years supervised the ventilation of the Houses of Parliament. He published in 1844 a book entitled "Illustrations of Ventilation." His observations and general statements are fairly trustworthy, but his deductions are sometimes at fault.

A more modern book is that of Dr. J. S. Billings, of the Johns Hopkins' Hospital fame, entitled "Ventilation and Heating," consisting of some 500 pages. It brings together a vast mass of useful information on the subject; but being written by an American principally for use in America, a considerable portion of its contents is unsuitable for this country, and a careful perusal of the volume left on my mind a sense of indefiniteness, examples being given of so many different methods without clearly indicating those that are worthy of adoption or those that should be avoided. There are numerous other writers on different phases of the subject, but the two mentioned are, so far as I know, the only books in English which deal with it exhaustively. Yet there is in both a lack of that practical guidance based on modern experience such as architects now require. The result has been to engender what I may term a chaotic state of mind in the profession. Some are inclined to dogmatise upon the simplicity of this or that method, while others prefer to do nothing, on the excuse that the difficulties are too abstruse. Nevertheless there are certain well-recognised facts which ought to be known by all, and intelligently made use of by those who realise the necessity for efficient ventilation or whose province it is to provide for it in our buildings.

It would be impossible for me in the course of an evening to go fully into what is known of the chemical and physical properties of the air we breathe. I must take it for granted that you are acquainted with its accepted composition and general characteristics. We all recognise our dependence upon the continuous breathing of atmospheric air to sustain life; but is it always realised that to sustain healthy life air must not only be breathed in sufficient quantity but that it must be of suitable quality?

Under ordinary conditions nearly everyone who can use the muscles of his body for filling his lungs may get quantity, but it is not always obtainable in suitable condition or state of purity. "Give us some air" is an expression often made use of even by people fully surrounded by air. What they really want is fresher or purer air. Ventilation, therefore, must deal with both quantity and quality, or it cannot be considered effective.

The science of ventilation may be said to consist in providing and employing means by which adequate quantity can be procured and the art of ventilation as that of securing a wholesome atmosphere for the purpose. Unless air is reasonably pure outside a building it is scarcely possible to have it pure within. Air may be screened and washed, but it is questionable if any means have yet been devised by which, in its passage from without to within a building, a thoroughly impure atmosphere can be made wholesome.

It is rather beyond the province of architects to practically deal with the outer atmosphere. The question of maintaining it in a reasonable state of purity is of necessity a communal matter, and must be attended to by the State and by local authorities; yet each individual is personally responsible to the community for every act of commission or omission which leads to contamination of the atmosphere. So much depends upon the condition of the outer air whether or no good ventilation can be secured within buildings, that it is right we should direct public attention to the fact that no means supplied by architects for securing ventilation within buildings can be effective unless the outer atmosphere is maintained reasonably pure and wholesome. Millions are spent in order to secure supplies of fresh, wholesome water, because people recognise that an impure supply results in ill-health, disease, and death. But probably in consequence of the subtle nature and obscure effects of the atmosphere which all of us constantly breathe, expenditure is ever grudged in obtaining it pure and wholesome even within our dwellings.

It is this subtle nature of the atmosphere which doubtless accounts for the difficulties most people find in dealing with it. They cannot see, and only with difficulty handle it. Yet, as Sir Wm. Preece when young is said to have been told by his father: "The air, although you cannot see it, is as material as water; you feel it in every puff of wind, and see it in every bending bough." I am convinced by experience that the possibilities of dealing with it for the purpose of securing ventilation are greatly facilitated by fully recognising the material nature of the atmosphere.

Air and water have different properties, yet in many respects they behave in a similar manner, and I believe the more thoroughly you study the latter and picture to yourself the material nature of the former, the better able you will be to make provision for adequate circulation of air in your buildings. Air is more universally distributed around the earth than is water, and, fortunately for us, it is in the open, naturally maintained in a fairly uniform condition; many influences being continuously at work to keep it in a sufficiently pure state for supporting human existence. Yet, even apart from human agency, it becomes fouled. In certain localities the atmosphere is well known to be unhealthy, and although it may appear heretical to say so, in these days when the open-air treatment is so greatly extolled, there is reason for believing that better health and comfort can at times be secured within doors than outside—or why should buildings be erected? Partly, no doubt, to shield ourselves from excessive velocity of winds, which may give us a pure atmosphere, but then the over-rapid movement of air is liable to so reduce the heat of our bodies when at rest that ill-health may result.

An important difference between air and water is that while air is very elastic and can be compressed, water cannot be reduced materially in bulk by compression. It is now demonstrated that air can be brought to a liquid and even solid condition, and we know that water can easily be frozen solid or volatilised. I mention these facts in the hope of impressing upon you the material nature of the atmosphere, that it can be handled and dealt with, that it is subject to certain laws which can be ascertained, it can be measured and weighed. Like water, it dissolves certain substances and vapours. It will hold in suspense insoluble matter. Fresh air, like fresh water, may become fouled by contact with impurity, either in the open, in confined vessels, or by passing through dirty conduits.

If desiring a "drink of water" you find it unpalatable, it would be folly to continue taking it from the same source in the expectation of getting a refreshing draught; or if you know of a pure source of supply, you would not willingly permit it to be conveyed in a dirty vessel or through a foul channel. Similarly you cannot expect to have fresh air unless it be taken from a pure source, and having a pure source around a building care should naturally be exercised so that it be not contaminated by contact with impurity, whilst entering or when within a building, before being breathed by occupants.

Architects being principally concerned in the design of buildings which, on being erected, cause obstruction to the free circulation of air, it is only reasonable that upon them should devolve the necessity for providing efficient means whereby adequate change of air can be secured within and around the buildings they design and erect, so that stagnation may not take place to the injury of those who occupy them, or to the detriment of surrounding properties.

Movement above all things is necessary for maintaining a healthy atmospheric condition. Consequently, the first consideration in respect to securing ventilation within a building is—how can the required movement be brought about? Probably the earliest buildings were erected in order to secure protection from excessive movement of the atmosphere. Our term "house," signifies a covering or protection. At an early period the necessity for securing ventilation must have been recognised, because in the simplest dwellings an eye or opening for the wind, now termed a window, was provided; and as there must also have been a second opening for the ingress and egress of individuals, means were provided by which movement of air within could take place. When it is understood that air is a material body it becomes evident that, before a fresh supply can enter, an equal volume must make way for it. Consequently an outlet as well as an inlet becomes essential, and at the present day buildings are mostly provided with both windows and doors, but, unfortunately, they are not so generally made use of for assisting ventilation as they might be, although by their reasonable regulation, according to the varying state of the outer atmosphere, it becomes possible, by the exercise of a little personal attention, to adjust matters. Except the property of diffusion, which is common to all gases, air has no inherent power of movement, but movement being essential for maintaining its freshness and for securing efficient ventilation, some power must be brought to bear upon it. The most potent natural power available is wind; yet wind is only the result of varying temperature on large bodies of the atmosphere. When heated, air becomes specifically lighter than an equal volume of cooler air; the latter falling by the power of gravitation, forces up the warmer, and therefore lighter air around; consequently it is the power of gravitation which principally causes natural movements of the atmosphere, *i.e.*, winds. Let me specially direct your attention to this, because I believe considerable misapprehension, in respect to possibilities of securing ventilation, has resulted from a somewhat slipshod manner in dealing with this scientific fact; for it is most commonly stated that heat causes air to rise, and that statement of the case has led many to infer that heat causes a suctional influence in a flue. By adequately appreciating the fact that no power is known which largely attracts air upwards, while we are well acquainted with the power of gravitation which attracts it downwards, you may realise that when a fire is lighted at the base of a flue it causes a body of air to expand, which then being lighter than the air around, the

latter is attracted downwards by gravitation and forces the warmer and lighter air to ascend. Such being the case, it is by propulsion and not by suction that the air of the room is changed when a fire is lighted at the base of a flue.

So much importance do I attach to a clear understanding on this point that I ask you to test the correctness of it yourselves; place two large thin glass vessels in a delicate balance, let each be filled with air of equal temperature so as to secure an even balance, now heat the air in one of the vessels, permitting the excess to escape as it expands, and it will be found that the arm of the balance which carries the lighter air will rise—not because it is attracted upwards by the lighter air, but because the heavier air on the other arm of the balance is attracted downwards by gravitation.

People of some scientific attainments with whom I have discussed this question, were inclined to treat it rather as a distinction without a difference, and asserted that where there is a push there must be a corresponding pull, and *vice-versâ*. Theoretically that may be, but practically it has certain limitations. You can pull with some effect by means of a rope, yet with it very little power of push can be exerted; with other substances—with fluids and even more so with gases—considerable force of propulsion may be exercised but very little "pull."

If you suck or draw air out of an enclosed space around which are various apertures, you will find that the incoming air will take the line of least resistance towards that outlet. Suppose the enclosed space to be a large room, with windows or other openings around, some high up, others lower down; if a suctional influence be brought to bear upon the interior, say by an extraction fan near the upper portion of the room, the greatest volume of air will come in by the openings nearest to the fan, and but little change will be effected in the lower portion of the room. Close all the openings high up, and the air will have to travel from greater distances, consequently better change of air within the room will be effected; but if people at the floor level are to benefit by that change they also run the risk of experiencing discomfort from draughts, because when a suctional power is made use of it is difficult to determine where the incoming air will enter, and some may be sucked in directly from the outside, and will certainly cause discomfort in cold weather. The effect is the same whether mechanical power or the natural force of wind be employed. So I think it fortunate that Nature has provided forces which act more strongly in propelling than in extracting air from dwellings.

Other terms used in connexion with our subject have been unfortunate from a scientific point of view, such as "Automatic Ventilation," "Natural Ventilation," and "Mechanical Ventilation," because ventilation is a result brought about principally by the exercise of an ascertainable power. It can never be properly described as "Automatic," "Natural," or "Mechanical." It may, however, be brought about by natural or by mechanical means, and there is, correctly speaking, no such thing or appliance as a ventilator unless there be also power acting in conjunction therewith. It is the power which causes change of air.

To my mind this should be most comforting to architects, because, as natural power must most frequently be relied on for securing ventilation, all that they can do in such cases is to provide suitable *means* in and about their buildings; for it rests with occupiers to maintain, regulate, and properly employ the means which every architect ought to suitably provide for ventilating his buildings.

In this country, at least, the warming of our buildings is necessary for several months in every year, during which times it is practically impossible to effect ventilation without considering the subject of warming in conjunction therewith.

Whether the lighting of a fire results in the development of a natural, artificial, or mechanical power, is not very material, the important fact is that it does develop a power, and an open fire is most useful, not only because it gives comfort by the heat it evolves, but because the power developed may be usefully employed to assist in securing ventilation.

Those of you who have followed up the subject, know what controversy there has been on the question of upward and downward ventilation. All will probably agree in condemning actual down draught, and I shall not attempt to defend that; but, what is draught? Why, simply an excessive movement of the air which causes discomfort. It has been ascertained that at a velocity of 4 ft. a second most people would complain of draught, some might at 3 ft., few would at 2 ft., and not even the most sensitive person is likely to complain of draught when the velocity does not exceed 1 ft. per second. The temperature of the air will naturally have some effect, so it must be assumed to be normal, *i.e.*, about 60° Fah.

Efficient ventilation of occupied apartments implies the continuous change of air without causing discomfort to or adversely affecting the health of occupants, and after several years observation I cannot detect the least objection to that change being effected in a downward direction, so long as draughts are avoided.

Because air respired and emanating from our bodies is warm, and being warm it is light and will therefore rise, is the argument used by the advocates of what they call upward ventilation, and they term it Nature's method. But, again, I believe this to be the result of an imperfect appreciation of scientific facts.

In the act of respiring, air is expelled with considerable force from the mouth and nostrils, largely in a downward direction, by the contraction of the lungs, and the expired air being warm and light is, at some distance from where it was emitted, *forced* upwards by cooler and fresher air coming down from above, for the benefit of the individual. Consequently, if our ventilating appliances are so arranged as to secure a constant supply of fresh air above the heads of individuals, and to carry off the expired air at a low level, is it not probable that, as occupants more generally occupy the lower portions of a room than the upper part, they are likely to obtain fresher air from the larger volume above their heads than from that below?

Take an extreme case, such as a compact body of people in an assembly hall—is it not evident that they can be supplied with fresh air better from above than from below, for in the former case the air above is far greater in volume, can circulate freely, and is likely to be more pure than the smaller volume below their heads, which can only move about with difficulty, and must be contaminated by emanations from so many people being congregated together? To ventilate efficiently such a crowded room from below is practically impossible, because even if fresh air be supplied from below, it must become contaminated by passing over the bodies of a number of people before being breathed, but it has been proved to be quite possible to do so from above.

If under such adverse circumstances ventilation can best be secured by downward movement of the atmosphere, surely it can be attained under more favourable conditions for smaller numbers. In an ordinary room, with an open fireplace, where do we find the outlet opening? Why, within 2 ft. to 3 ft. of the floor level. Every one can prove for himself that, unless some greater power be exerted, such as a strong gust of wind or a much larger fire in the same or in an adjoining room, etc., which will only occasionally occur, the sole outlet for air is by the fireplace flue. If any present are not thoroughly convinced of this fact, I beg they will test it for themselves. A lighted match or a piece of thin paper held before every possible opening is all that is necessary, and I venture to say that under normal conditions they will easily detect that air is entering at every other opening and only quitting the room by the fireplace flue. Bearing in mind then that efficient ventilation implies comfort for the occupants of a room, the next question is—Where should any special inlet for air be placed? I say "special inlet" because if air quits the room by the fireplace flue, other air must enter some way or other to replace it; generally you will find it comes in through casual cracks and crevices around the lower portion of the room, and travels in narrow streams direct to the fire, frequently resulting in unpleasant draughts, and the more thoroughly cracks and crevices are closed the more likely will discomfort be experienced from draughts. On this point I shall have something to say later on. At present we are considering an ordinary room, built in the ordinary manner. And although it may appear paradoxical, the best way to prevent draughts is really to admit air more freely. It may involve rather more expenditure of fuel for maintaining comfortable warmth, but that is better than catching colds. If, however, change of air is too rapid in any room, the only way to prevent it is to reduce the outflow by contracting the sectional area of the outlet flue, because it is the cooler air pressing in on all sides which forces the air of the room up by that flue. And, as with the same pressure only a given quantity of air can be forced through a flue of given section, reduce that section in size and a less volume of air will be passed through it in a given time under similar conditions. Consequently the velocity with which the air will travel from inlet to outlet becomes lessened, and draughts in the room may be overcome, but then the question will arise—Is the room being efficiently ventilated? If not then the outlet flue area must again be enlarged, and a special inlet provided. So we come back to the question—Where shall it be placed? After careful observation and experiment, extending over several years past, I say, without hesitation, that it should be on the same side as the fireplace opening, as nearly central thereto as may be, and towards the upper portion of the room (say, about 2 ft. below the ceiling). By providing louvres or other means for distributing the incoming air throughout the upper portion of the room, it will mix with the warmer air rising in front of the fire, spread out, gradually fall and make its way towards the fireplace flue, without causing discomfort, because its velocity will be slight, and, coming in contact with the warmed surfaces in the room, its temperature will be raised, while if the fresh air enters freely at the special inlet, less air will enter by the casual cracks and crevices. With inlet openings in any other position there will be less diffusion throughout the room, because incoming air will take a shorter and more direct line towards the fire and leave portions of the room less perfectly ventilated. If the arrangement I suggest is right, then downward ventilation with comfort is secured.

Another subject in connexion with ventilation to which I have devoted attention is that of condensation and evaporation. I do not think these results, brought about continuously by variations in temperature and movements of air, have received the consideration which they deserve, for they exercise very decided influences in connexion with ventilation. As the temperature of air is raised it becomes more and more capable of absorbing moisture and is specifically lighter than dry air at the same temperature. Again, as it cools by coming in contact with cooler surfaces, moisture is deposited, and becoming specifically heavy, the air falls. Vitiated air may for a time be somewhat purified by condensation, but the impurities are deposited upon the cold surfaces with which it comes in contact, and unless those surfaces are frequently cleansed, the animal matter deposited with the moisture in time putrifies, with the result that rooms become stuffy where such condensation takes place and is not soon removed. You may open the windows freely and freshen up the atmosphere for a time, but when again closed up the stuffiness again becomes apparent, particularly if a fire be lighted, because heat assists in volatilising the impurities. For this reason I hold the opinion that the most healthy rooms to live in are those of which the walls are not constructed of dense materials which do not retain heat. In fact, I believe that rooms, the walls of which are constructed of pervious materials, are likely to be the best ventilated, even when no special inlets for air are provided. Such walls take up and retain heat from the fire, they allow air to pass through them over their whole surface, the air is filtered and takes up heat in its passage through, it enters gradually yet in large volume, and keeps up a thorough change of atmosphere in the room without perceptible draughts.

Some think that the continual passage of air through the walls will in time contaminate them, but with reasonably pure air outside and exercising its known purifying effect, it is more than likely that no deleterious effect upon it would take place, provided always that the walls are kept dry. Wet in the walls would partially close the pores, and probably cause vegetable and, maybe, animal growth. Unless ample provision be made for permitting continuous change of air in a room, nothing can be worse than constructing all walls, floors, and ceilings of impervious materials, or than the covering of all surfaces with impervious materials—such as linoleum, lincrusta, paint, etc.

Movement of air outside—in a word, wind—is the active force by which ventilation within doors is principally brought about; consequently, when rooms are unoccupied windows and doors should be freely opened, so that frequent change of air may take place. Surfaces and materials on which deleterious matters have been deposited or by which they have been absorbed, may then become purified, in addition to which, the frequent cleansing of surfaces and materials is necessary if a pure atmosphere within doors is to be maintained. Some places, even with air constantly changing, are never sweet and wholesome. Urinals and the household water-closets, unless all surfaces are kept scrupulously clean, are unwholesome places which may contaminate the atmosphere of a house. Many of these appliances are still badly constructed, particularly in public places. Generally speaking, at railway stations they are a disgrace. The large surfaces contaminated and infrequently cleansed constantly generate noxious fumes which foul the air, change it never so frequently. Public urinals are capable of great improvement; there should be no angles in which deposit can accumulate, open channel ways should be abolished, each separate urinal should be trapped and provided with a frequent flush of water so directed as to cleanse all surfaces which can be fouled. Properly constructed and maintained little contamination of the atmosphere will take place in and around them. I draw attention to these necessary appliances as being illustrative of our subject, and to impress upon you that mere change of air is not all that is required to secure good ventilation; cleanliness and the continuous removal of everything which defiles the atmosphere is quite as essential, particularly in and about the channels or ducts which convey air from without to within the building.

Let us summarise the points to which reference has already been made:—

1. The deductions of early writers or of those who simply adopt their views should not be accepted without personal examination as to their correctness.

2. Ventilation is an effect always brought about by the exercise of an ascertainable power; it is never automatic, and no appliance without the employment of power is, properly speaking, a "ventilator," but simply a means by which ventilation may be secured when a power acts to cause movement of the atmosphere.

3. Air to be serviceable for ventilation must be kept free from defilement.

4. To secure change of air within doors, both inlets and outlets are essential.

5. Warm air rises, because it is forced upwards by cooler air, the latter being attracted downwards by gravitation.

6. Nature's principal method for causing movement of air is propulsion.

7. By taking precautions to reduce velocity and so to prevent unpleasant draughts, the downward movement of air may reasonably be employed for securing ventilation.

8. To secure fresh, wholesome air for the purpose of ventilation within doors, condensation on surfaces should be guarded against, and all surfaces, as well as the substance of materials, should be maintained in a clean condition.

In this country, as I have previously mentioned, it is necessary to employ heat during some four or five months of the year for the sake of comfort within doors, and the open fire has been referred to as a means for assisting ventilation, because it necessitates a flue by which the products of combustion may be carried away. Such flues, even when no fire is alight, generally act as outlets and so assist in the ventilation of an apartment. To close them by a register or any other means is, therefore, an improper proceeding and should on no account be resorted to. Other forms of heating—say by steam or hot-water pipes or by electricity—do not on their own account necessitate separate flues from the apartments heated, but it is quite as essential that outlets—as well as inlets—should be provided if change of air is to take place in apartments so heated.

Judging from the various schemes for ventilating buildings which have come under my notice, I am surprised to find what little attention is given to even the most elementary calculations as to the probable results which will be attained notwithstanding that certain data have been arrived at, which experience proves to be fairly reliable, and so simple that there is no excuse for neglecting to employ them. Failure, where it takes place, results generally from under-estimating the supply of air necessary for securing efficient ventilation, and from the employment of restricted areas of inlet or outlet channels, openings, or ducts.

An ordinary room is provided with one fireplace flue, and, as previously stated, when a fire is lighted, that flue is practically the only outlet for air from the room. Consequently, by ascertaining the velocity of air passing up the flue and the sectional area of the flue, it is easy to find how much air will pass through the room in a given time.

Several influences will be at work at varying times which will affect the velocity of air passing up the flue, such as more or less fire in the grate, more or less force of wind outside, larger or smaller inlet openings, etc., but under medium conditions a flow of about 5 cubic ft. per second may be taken as the average volume passing up an ordinary 14 in. by 10 in. flue. Kindly note that I give the volume at about 5 *cubic ft.* I do this for the purpose of simplicity, and because it is near enough for practical purposes and can easily be remembered. If 5 ft. be multiplied by 60 times 60, the number of seconds in an hour, the result—viz., 18,000 ft.—will be the volume of air passing through the room in that time, and if change of air be demanded at the rate of six times per hour, the cubical capacity of a room with only one fireplace flue should not exceed 3,000 ft., say 20 ft. by 15 ft. by 10 ft.

A point which requires consideration is the size of a special inlet relative to that of an ordinary fireplace flue. A good rule is to have it of ample dimensions with easy means for its regulation. It is then the fault of the occupants if care be not taken to adjust it to requirements. The difficulty, however, is that people are generally careless in paying attention to so simple an appliance—on a windy day the opening will be closed to prevent discomfort from draughts, and no one thinks of opening it in calmer weather; therefore, when the inlet is placed as I advise—on the same side as the fireplace and as nearly central thereto as possible, about 2 ft. below the ceiling—a clear opening of about one half the area of the outlet flue will suffice, for the following reasons:—

1. If the inlet is simply through an external wall there will be less friction than in the long outlet flue, therefore the velocity can be greater.

2. Because with a properly-formed and louvred inlet the additional velocity in the upper and unoccupied portion of the room will distribute the air throughout better than if entering at low velocity.

3. Because variations in the force of wind outside will not be so much noticed within the room when the area of inlet-opening is not excessive.

But because of the well-known and frequent variations in the force of wind outside I have devised this little automatic regulator. You will notice that in calm weather the central flap will stand stationary allowing some 2½ in. of space for the air to pass in, but as the force of wind increases the flap will be deflected and the available space is thereby reduced proportionately. A difficulty which took some time to overcome was, so to hang the flap that its movements could take place without producing a clicking noise; after several attempts I believe this has been successfully accomplished, consequently the appliance may be usefully employed to avoid the necessity for any personal regulation, and I believe it should go a long way towards solving one of the difficulties hitherto experienced in securing constant and adequate ventilation without personal attention. Only one size is made, suitable for a room with a single ordinary flue, two or more of the automatic inlet regulators being necessary for larger rooms. Attempts have previously been made in the same direction, but the difficulty of overcoming the annoyance of clicking noises in appliances with movable parts has militated against their adoption. Having no pecuniary interest whatever in the appliance, I may safely commend this automatic inlet regulator to your favourable consideration.

Much more might be advanced as to the necessity for considering details in connexion with the employment of natural means for securing efficient ventilation, not only in domestic buildings but also in those for more public purposes. Let me again remind you that doors and windows can, and should, be more generally regarded as legitimate means for securing change of air within buildings. Windows should be constructed so that they may with ease be opened and closed, and that whenever practicable they should be freely opened, particularly at times when the buildings are unoccupied. Although the many appliances called ventilators, employed when open fires are not employed, only permit of the passage through them of a limited amount of air—for, as a rule they are too small in size, and are only serviceable when there is sufficient movement of the outer atmosphere—it fortunately happens that in this country some movement is taking place more frequently than not, and one advantage secured by the use of ventilating appliances is that a certain amount of change of air takes place through them almost continuously. For continuous occupation however the change of air which takes place when such appliances alone are depended upon, is generally inadequate—a few figures will easily prove this. Ascertain the cubical capacity of the building and the total minimum area of the free openings in the appliances, and find the time required for the volume of air contained in the building to pass through the openings say at a velocity of 5 ft. per second, and unless the whole volume can pass through in twenty minutes, *i.e.*, at the rate of three changes per hour, efficient ventilation will not be secured for reasonable occupation of the buildings during any considerable length of time. In calculating the amount of change of air required in a building it is safer to take as a basis the cubical contents and number of changes per hour than to take the number of people to be accommodated and allow so many cubic feet of air in a given time for each, because it is important to remember that the building itself has to be ventilated as well as that the occupants require change of air.

For this reason I have come to the conclusion that, unless it is considered worth while continuously to ventilate buildings when mechanical means are provided, there is risk of failure, because when the mechanism is stopped change of air ceases, and although when the machinery is restarted change of air may soon be effected, the long period of stagnation permits the materials of and in the building to cool down; condensation then takes place on all exposed surfaces and other influences deleterious to the atmosphere of the building may, for a considerable time, result.

For buildings such as hospitals which are continuously occupied and throughout which it is important that continuous and ample change of air should take place, together with uniform heating, I thoroughly believe that mechanical means will in time become an absolute necessity. Having recently dealt with this subject at the R.I.B.A., I will only now say that to successfully ventilate a building by mechanical means implies a considerable knowledge of the various appliances available—there must be no stinting of space or of materials necessary to secure the most thorough and economical results. A change of air up to ten times per hour must be insisted upon, the plant in all important features should be duplicated and the most economical power available should be employed. All air ducts and channels should be of ample sectional area so as to reduce friction to a minimum and so that they may be readily cleansed; both inlets and outlets must be arranged with judgment and properly proportioned. The air must be taken in at a point most free from contaminating influences, it must be screened, brought to a suitable temperature, and hygrometric condition, and passed on to the several apartments required to be ventilated, without the possibility of its becoming deteriorated until it approaches the outlets and is again discharged into the open, through properly constructed outlets so that movements of the outer atmosphere may not exercise any influence upon its outflow.

For some time there was considerable controversy as to whether methods of propulsion or of extraction were to be preferred. I believe that by far the majority of those who have had practical experience in the matter are now more favourable to propulsion. One of the most serious mistakes has been the combination of the two systems, for they cannot possibly be worked together economically, and I fear that even if expense were no object, imperfect results only can be attained by employing conjointly means for securing extraction as well as propulsion.

Experience of the practical working of well-proportioned installations of Plenum ventilation

by mechanical means has proved to me that it is possible to secure continuously, and at a reasonable expenditure, efficient ventilation such as is quite out of the question when natural means alone are relied on. In saying this I on no account undervalue the necessity for taking advantage of the means which Nature places at our disposal, because I realise that for the majority of buildings anything in the way of mechanism for securing ventilation is out of the question at present, although I venture to predict that, as time goes on and the possibilities of employing mechanism for the purpose are more appreciated, an architect's training will not be considered complete unless he has made himself fully acquainted with the principles and appliances by which buildings may be successfully ventilated by mechanical means.

Mr. John Murray, in proposing a vote of thanks, said he had very little criticism to offer upon such an excellent paper, which would assist students in studying this important and intricate subject. They all knew that Mr. Henman advocated the plenum system of ventilation, but the great difficulty about that system when applied to ordinary buildings was in getting the appliances so arranged that the shafts or ducts could be properly cleaned. He would like to know how a small shaft could be arranged so that it could be adequately cleaned. It was quite possible to keep them clean in large institutions, such as the Victoria Hospital at Belfast, but the difficulty, he felt, was with small installations. In most systems of ventilation the great difficulty was to get sufficient personal attention devoted to the regulation of the mechanical appliances, and he felt that no system of ventilation could be satisfactory unless it was continually attended to and regulated. One might provide a carefully arranged and adequate system, but the people who had to regulate it did not attend to it, and the result was not satisfactory. He would like to know whether Mr. Henman advocated the use of ventilating electric fans in conjunction with the plenum system. An electric fan might be of assistance, but Mr. Henman seemed to suggest that it was not necessary. [Mr. Henman: As a propelling power or suction?] As suction. He would also like to know Mr. Henman's views upon inlet ventilating stoves, where the air was admitted about 2 ft. above the outlet opening, also how much air passed through an ordinary 9 in. brick wall, plastered on one side. Did Mr. Henman consider one fire flue in an ordinary London dwelling sufficient to ventilate properly a room, provided that sufficient inlets were supplied? In the case of inlets to an ordinary dwelling room, how high should they be from the floor? A great difficulty in London, and perhaps in most towns in England, was the screening of air which passed into a room, and it seemed to him that no house could be properly ventilated unless there was a screen arrangement connected with every inlet. That appeared to be an expensive and very intricate matter to arrange, but he felt we should never get adequate and efficient ventilation until some simple mechanical device was invented to screen the air at its entrance and before passing through such an arrangement as the inlet shown by Mr. Henman. They all knew that air could be purified in the case of large buildings, but the difficulty was to screen and cleanse it through small inlets into ordinary rooms. Another difficulty in connexion with plenum ventilation was the regulation of the degree of heat. The plenum system or the warm-air system was very largely used in American houses, and he knew from the experience of friends of his that American houses were not always healthy, because they were frequently overheated, and the air was not always pure, because it was carried through the buildings in small ducts, which became dirty, and the air was thus tainted. Mr. Henman suggested that the external air might be purified, whereby it might be admitted in a purified state into our domestic buildings, but he (the speaker) was afraid that that would never be effected in towns.

Mr. H. P. G. Maule, who seconded the vote of thanks, said there were one of two points that naturally occurred to one in listening to such a paper. Take the case of an ordinary dwelling house: it seemed to him that it would be rather difficult to insert a ventilator of the kind Mr. Henman had shown in the walls of a dining-room or drawing-room, and he should like to know if Mr. Henman had any special method of dealing with an ordinary dwelling house where there was some architectural treatment of the walls. There was one point which seemed to be always overlooked, and that was the education of the public in the matter of appreciating fresh air coming into rooms through windows. If one accustomed oneself to live in a house with open windows, any other condition could not be tolerated for long. One learnt to appreciate purity and freshness of air so much that in entering a room one could tell at once whether the window was open or not. He ventured to say that he could go into a room with his eyes shut and could tell in half a minute whether the windows were open or shut, and that because he accustomed himself, winter and summer, to wide open windows, and he thought that architects, in ordinary domestic work, were in error in providing anything like mechanical methods of ventilation. It was a matter of the education of the individual rather than the ventilation of the house by mechanical means. The point raised by Mr. Murray as to the cleansing of ducts seemed to be the crux of the Plenum system. Mr. Henman had said it was of the utmost importance that the flues should be kept clean, but, human nature being what it is, unless the flues were sufficiently large to enable people properly to clean them, they would in course of time most certainly become foul. If the extract of a room was by the fireplace flue and the inlet to the room was only half the size, surely the amount of ventilation one would get in the room, supposing the windows were shut, would be quite inadequate on the assumption that there were more than a certain number of people in it. If the number of people in a room was increased, there ought to be special provision for allowing more air to come in. He did not see how the insertion of one or two ventilators in the walls of a room would adequately ventilate that room unless the windows were opened too. The paper they had heard was a very interesting one, which they would want to turn to for information again and again.

Mr. W. J. H. Leverton asked Mr. Henman whether he found his methods of ventilation sufficient when gas was burning. In ordinary circumstances during the day, with the air coming in at an opening 2 ft. below the ceiling on the side of the fireplace, the air would be properly diffused, and would find its way out of the chimney, but with the ordinary gas burners creating fumes he was afraid that the arrangement recommended would not be sufficient.

Mr. Alfred Burgess said that Mr. Henman had made some very clear distinctions. A ventilator originally was a man who turned a wheel, and it was interesting to see how correct was Mr. Henman's statement that proper ventilation could not take place unless there was some mechanical force to aid it. In mechanical ventilation there were really three processes which might be adopted, and he did not agree that a system of propulsion and extraction would not work satisfactorily. The conclusion of the committee appointed to consider the ventilation of the House of Commons was that the ordinary propulsion of air into a building should be assisted by extraction. Almost every mechanical system of ventilation was apt to be called a plenum system, and it was necessary to define the three processes he had referred to. There was the system which consists in putting air into a building at an excess of pressure on that outside the building; there was also that system of drawing air through a building so that a slight vacuum might be created; and there was the conjunction of the two, which was used in the House of Commons, *i.e.*, putting the air in at one end by a fan and extracting it at the other. By this means they avoided excess of pressure and also a vacuum, and got instead an equilibrium, which was a good name for the third system. He thought it was a good thing that architects, when discussing mechanical ventilation, should make use of definite terms in regard to the different systems which they were describing.

Mr. A. Needham Wilson asked Mr. Henman what he thought the height of rooms should be in houses where the system of ventilation he favoured was adopted. One of the difficulties one had to deal with was that the average client insisted on excessively high rooms, and Mr. Henman's conclusions quite disposed of the idea that high rooms were necessary for their efficient ventilation. Mr. Henman's statements seemed rather to reverse the accepted order of things; if we want to let out foul air from rooms we must open the windows at the bottom, and if we wanted to let fresh air in we must open them at the top.

The President, in putting the vote of thanks to the meeting, said that two things had struck him in the course of the evening. It was cheering to hear from an expert like Mr. Henman that the much-abused open fire was still a satisfactory means of ventilating a room. They had heard so often about its wastefulness, and that we ought to use stoves and radiators, that it was pleasing to hear for ordinary dwelling rooms we could make use of the open fire. With regard to the ventilator, a model of which Mr. Henman had shown, he understood it had to be put about 2 ft. from the ceiling and on the same side as the fireplace; but in most houses the fireplace being on the inner wall, he did not quite see how the ventilator was to connect with the open air when the chimney was in the centre of the house. As far as he could gather from the paper, the jerry-built house was the one most satisfactorily ventilated. Plaster made of mud and bricks made of sawdust produced a perfectly-ventilated house without any of these mechanical means!! Any mechanical appliance that depended on people for regulation and attention was bound to get out of order, for they would not be attended to. Under the new by-laws which were insisted on ventilators had to be put in, but as soon as any draught was felt the occupants invariably closed them, and depended on doors and windows for ventilation. There was one thing that was not insisted on sufficiently with regard to ventilation, and that was keeping walls and surfaces of rooms absolutely clean. There was no doubt that if a room was kept closed up for any time the walls would get dirty and foul, and the furniture too. To a certain extent he agreed with Mr. Maule about the open window, but it would be a difficult matter to persuade people in a city like London to keep open their windows. The great object seemed to be how to keep out the soot and dust and fog, which spoilt almost everything in a room.

The vote of thanks having been very heartily agreed to,

Mr. Henman, in reply, said that his experience had been contrary to that contained in what were called the recognised works on ventilation. He found that nearly everyone writing on the subject went back to Dr. Reid, and although Dr. Reid made the most careful experiments with the apparatus he was able to obtain in his day, nevertheless in regard to many of the important statements and the deductions he made he was scientifically wrong, and it was for that reason that he (the speaker) had put before them the particulars he had. He hoped he had given his reasons sufficiently clearly, and that they would be able to see that Dr. Reid was wrong in the conclusions he arrived at. As to the question of keeping the air channels, ducts, and flues clean, in any system of ventilation, mechanical or natural, it was a question of having the flues get-at-able; unless the flues were kept clean good ventilation could not be obtained. Flues should be so arranged that they could be swept, and "if they are arranged so that they can be swept, then sweep them." As to walls being pervious, and as to the amount of air that would come through, several experimentors had tried to ascertain this. It differed with every class of material and every surface put upon a wall, but it was surprising what an enormous amount of air came through the walls of an ordinary room. He had been in rooms where he had known that the bricks and materials were thoroughly pervious, and the air of these rooms had always been fairly sweet and clean. On the other hand, some thirty-five years ago he took an office on the walls of which was a thickly varnished grained paper, which, as he could not endure that sort of thing, he had painted a dark green. There was linoleum on the floor and the ceiling was painted, and so uncomfortable was the room that he had to give up the office for that reason. Air could enter only through cracks around the doors and windows, or by a special inlet over the door situated on the opposite side to the fireplace. It was one of the most uncomfortable rooms he had ever been in, stuffy without a fire and very draughty with one; and wherever you sat on a cold day you were in a draught, and you could not prevent it. The more you shut up the pores of a room, the more this would be so. Air would come in, and if it did not come through the materials it would come through cracks or windows, and cause a draught in its passage across the room to the chimney. He had told them that air heated in a flue

ascended because it was propelled upwards by the surrounding cooler air being attracted downwards by gravitation; the outer air was then pressing in all directions, seeking entrance to the room; if openings were few and of no great size, air would be forced in thin streams rapidly in direct lines to the fireplace, probably causing unpleasant draughts, and yet not efficiently ventilating the room. With larger openings more distributed, better results might follow, but with one or two properly constructed openings on the fireplace side about 2 ft. below the ceiling, the incoming air might be well distributed throughout the upper portion of the room, and would return towards the fire at low velocity from all parts much in the same way as it would if it came in through pervious walls, floor, and ceiling. As to propulsion and extraction being combined, it was one of the greatest of mistakes. It was a fallacy altogether, to begin with, that the two could be used economically. It was not effective. In connexion with this room they were occupying, if there were a propelling fan of sufficient power to force in a volume of air equal to a change throughout of, say, ten times an hour, all that would be necessary for doing it effectively would be to properly dispose and proportion the inlets and outlets. The addition of an extraction fan could not possibly help matters, it would simply entail extra expense; but supposing that the propelling power were not sufficient to effect the required change, then it might be supposed that supplementary power would be necessary; yet it should not be in the direction of extraction, because if air from the apartment were *forcibly* removed, other air must enter, additional to that supplied by the propeller, hence it must be drawn from somewhere else probably through casual cracks and crevices, resulting in draughts, or it may be sucked from impure sources. Under such conditions the ventilation of the apartment could not be said to be efficient. If, however, instead of supplementing a propelling power by one of extraction, the propelling power were augmented, better results might be expected, provided the inlets and outlets were properly arranged and proportioned. Propulsion and extraction could not be used together effectively. It had been done in the Houses of Parliament and the Law Courts, where the ventilating appliances were not sufficient, and extraction fans had been put in in addition to propulsion; but people complained of draught, and that was because the air was being drawn from some position from which it did not require to be drawn, and thus a draught was caused. Generally it was adopted as a makeshift; the original means provided having proved inadequate, supplementary power had been made use of, too often in the wrong direction. At the Victoria Hospital, Belfast, and at Birmingham Hospital the rooms were perfectly ventilated, at a considerable distance from the propellers, without any extraction whatever. As to the position of the ventilator he had shown that evening, when the fireplace was on the internal walls, generally there was a recess, and if the flue prevented the ventilator being placed on the chimney breast, then it could be put in the recess—as nearly central to the flue as possible, he said. In his own rooms he had put a ventilator on each side of the chimney breast, and he had been complimented on the efficient way in which his rooms were ventilated. As to the height of rooms, that was a point about which his clients rather laughed at him, but he had been pleased to find that a number of architects who had built houses for themselves had low rooms, but it had been suggested to him that that was because architects were not troubled with much money, and they had low rooms in order to keep down the expense. He was inclined to think that many of them realised that, provided there was not a lot of gas burning—gas fumes were a difficulty, but we were using electric light much more generally now—low rooms were better for comfort and good ventilation. They reduced the cubical capacity by having low rooms, and if they used a propelling force for ventilation it would cost less to change the air often with a small cubic capacity than if the cubic capacity were larger. Or the air at a given power could be made to pass through a small room more quickly than in the larger room. As to the height of the rooms, it was a question of taste, and it must depend on the size of the room to get the right proportion. He had to enlarge an old house, and the height of a room not half as large as the one they were then in was 7 ft. 4 in., and that did not seem an uncomfortable height, and a large class was held in the room. People had high rooms, he thought, because of gas fumes. If one mounted a ladder in a room in which gas had been burning some time, they would realise what a state the air got into, and all that foul air having no means of escape, had to come down in the ordinary way, but if the ventilator were at the upper part of the room the fresh air was constantly sweeping that away. Any opening, other than into the fireplace flue, served as an inlet for air whenever a fire was alight, and if the opening was high up in the fireplace, air only passed away by such an opening under most favourable conditions, and back flaps were necessary to prevent the egress of smoke from the fire. The air at the top of the rooms in his house was constantly fresh.

The Chairman announced that the next meeting will be held on November 25, when Messrs. J. T. Micklethwaite and E. Prioleau Warren would deal with the subject of "Excavations in Westminster."

The meeting then terminated.

THE SURVEYORS' INSTITUTION:

PRESIDENT'S ADDRESS.

THE first meeting of the new session of the Surveyors' Institution was held on Monday evening at No. 12, Great George-street, Westminster, S.W., Mr. H. T. Steward, President, in the chair.

Mr. Currey, Hon. Secretary, read a list of donations to the Library and the Library Fund, and on the motion of the Chairman a vote of thanks was accorded to the donors.

On the motion of the Chairman, Lord Armstrong, of Newcastle-on-Tyne, was elected an honorary member of the Institution.

The President then read his opening address, the first part of which dealt with the question of housing.

The Housing Problem.

He said that out of a total population of 32,678,213 persons in England and Wales, rather more than 15,000,000, or nearly one half, are dwellers in London and seventy-five other great towns. The towns have to find quarters on a limited space for nearly half the population of the Kingdom. London alone, with its 74,839 acres, has within it 4,536,541 persons, dwelling in 1,019,646 separate tenements, exclusive of the City proper. The recent census showed that of these 1,019,646 tenements 672,030 are tenements of fewer than five rooms, 149,524 being single room tenements, of which 60,421 were occupied by one person only, 48,341 by two persons, 23,680 by three persons, 11,279 by four persons, 4,001 by five persons, 1,257 by six persons, 384 by seven persons, 103 by eight persons, and 58 by nine or more persons. The latest returns available at the moment showed that eight of the principal companies have in their dwellings some 120,000 persons distributed approximately as follows:—

1. Metropolitan Association for improving the Dwellings of the Industrial Classes	6,000
2. Trustees of the Peabody Donation Fund	19,000
3. Improved Industrial Dwellings Company	29,000
4. Artisans', Labourers', and General Dwellings Company	42,000
5. Victoria Dwellings Company	4,500
6. East-end Dwellings Company	5,600
7. The Four per Cent. Industrial Dwellings Company	4,200
8. Guinness' Trust	8,500

The Metropolitan Board of Works and the London County Council have made, or the latter body is in course of making, provision for some 70,000 persons, and the railway companies, and other commercial undertakings have provided under their Acts for about 15,000 more. The great landlords of London, and the Ecclesiastical Commissioners, and the borough councils have also materially aided in the erection of dwellings for the working classes.

With regard to the class of persons who occupy the dwellings provided, it was interesting to notice by the return of the London County Council that in thirteen of their schemes, out of 1,458 heads of families in their dwellings on December 31, 1899, there were persons of over 100 distinct callings, of which about half may be classified as artisans, presumably earning good weekly wages; while a considerable number of the other half belonged to the class of skilled labourers, but included 7 clergymen, 32 clerks, 73 policemen, 39 postmen, and 26 salesmen. While the population of London was, of course, increasing as a whole, it was satisfactory to find that the ratio of increase had declined in the last five decennial periods from 18·8 per cent. in the census period 1851-61, to 7·3 per cent. in the period 1891-1901. According to the last census the population of Shoreditch since 1891 had decreased 5 per cent., Finsbury and Westminster 9 per cent., Holborn 10 per cent., and the City 30 per cent., while the population of Chelsea, Bethnal Green, and Poplar had increased 1 per cent., Southwark 2 per cent., Islington 5 per cent., and Stoke Newington 7 per cent. The places in which a marked increase had taken place were Greenwich 20 per cent., Lewisham 45 per cent., Fulham 48 per cent., and Wandsworth 50 per cent. This increase was, however, only to have been expected, as there was vacant land in these parishes, and such districts would until quite recently have been deemed suburban.

In spite of the great increase in the facilities for locomotion and the cheapening of transit in recent years, and the disposition to remove factories to the suburbs, while London remains the centre of the life of the country, there must necessarily be a large number of the working class population who, not only by inclination desire to, but by the nature of their callings must, reside in the central districts. The working class population in these districts where, even under the best conditions, their surroundings must be of a somewhat depressing character, would be materially benefited by removal to an open or more cheerful neighbourhood where they might feel the influences of better surroundings, and it was to be hoped that the efforts of the London County Council in this direction might meet with the success they deserve. We must all have noticed the recent erection, in the nearer suburbs, of rows and rows of small flats or double tenement houses, of good exterior, and with internal fittings and conveniences beyond the dreams of twenty years ago. In these dwellings could be traced the influence of improved housing upon the habits of the occupants—in the rivalries in flower-beds and white lace curtains, and in general attention to external appearances; but they were, generally speaking, occupied by those in more or less regular employment at fixed wages.

As to lodging houses, in addition to those already provided, the London County Council was, he believed, about to erect a lodging-house of the superior kind for women on the south side of the Thames; while the Directors of Rowton House, he understood, have had the subject under consideration for some time past, and would, no doubt, as opportunity offered, erect one of their Rowton Houses for women. It was to be hoped that such a building might prove a success, and be the forerunner of others, as a house of the kind would be a great benefit to women, and should tend to prevent the overcrowding that at present exists in some parts of London. By overcrowding he did not mean the mere density of population. It was the overcrowding in particular rooms that was the evil. No doubt at the present time, in spite of the law, there were a large number of persons living in houses that were overcrowded in direct contravention of the Public Health Act, 1891. Putting the law in force often meant driving people to the streets or to the workhouses, and for this reason the magistrates hesitated to use the full powers of the law, and frequently decline to make closing orders.

Rural By-laws.

"Before I leave the subject of working-class houses," continued the President, "I should like to add a few words about the by-laws now pretty generally adopted in rural districts in so far as they affect cottages in the country or in proximity to towns. Many of the councils in rural districts, with, no doubt, laudable intentions, have adopted model by-laws with reference to houses framed on the London Building Act, a statute totally inapplicable to cottages in the country, with the result that landlords and others are discouraged from providing them, as the cost of building is altogether disproportionate to any return that can be obtained. It is worthy of note that one of the judges of the High Court has lately been, and I believe still is, in conflict with a rural authority upon the subject, and I trust this may lead to some alteration in the future by a remodelling of such by-laws as those to which I have alluded.

Increase in Parish Rates.

"The large increase in the parish rates of recent years is a matter of much concern to

by mechanical means has proved to me that it is possible to secure continuously, and at a reasonable expenditure, efficient ventilation such as is quite out of the question when natural means alone are relied on. In saying this I on no account undervalue the necessity for taking advantage of the means which Nature places at our disposal, because I realise that for the majority of buildings anything in the way of mechanism for securing ventilation is out of the question at present, although I venture to predict that, as time goes on and the possibilities of employing mechanism for the purpose are more appreciated, an architect's training will not be considered complete unless he has made himself fully acquainted with the principles and appliances by which buildings may be successfully ventilated by mechanical means.

Mr. John Murray, in proposing a vote of thanks, said he had very little criticism to offer upon such an excellent paper, which would assist students in studying this important and intricate subject. They all knew that Mr. Henman advocated the plenum system of ventilation, but the great difficulty about that system when applied to ordinary buildings was in getting the appliances so arranged that the shafts or ducts could be properly cleaned. He would like to know how a small shaft could be arranged so that it could be adequately cleaned. It was quite possible to keep them clean in large institutions, such as the Victoria Hospital at Belfast, but the difficulty, he felt, was with small installations. In most systems of ventilation the great difficulty was to get sufficient personal attention devoted to the regulation of the mechanical appliances, and he felt that no system of ventilation could be satisfactory unless it was continually attended to and regulated. One might provide a carefully arranged and adequate system, but the people who had to regulate it did not attend to it, and the result was not satisfactory. He would like to know whether Mr. Henman advocated the use of ventilating electric fans in conjunction with the plenum system. An electric fan might be of assistance, but Mr. Henman seemed to suggest that it was not necessary. [Mr. Henman: As a propelling power or suction?] As suction. He would also like to know Mr. Henman's views upon inlet ventilating stoves, where the air was admitted about 2 ft. above the outlet opening, also how much air passed through an ordinary 9 in. brick wall, plastered on one side. Did Mr. Henman consider one fire flue in an ordinary London dwelling sufficient to ventilate properly a room, provided that sufficient inlets were supplied? In the case of inlets to an ordinary dwelling room, how high should they be from the floor? A great difficulty in London, and perhaps in most towns in England, was the screening of air which passed into a room, and it seemed to him that no house could be properly ventilated unless there was a screen arrangement connected with every inlet. That appeared to be an expensive and very intricate matter to arrange, but he felt we should never get adequate and efficient ventilation until some simple mechanical device was invented to screen the air at its entrance and before passing through such an arrangement as the inlet shown by Mr. Henman. They all knew that air could be purified in the case of large buildings, but the difficulty was to screen and cleanse it through small inlets into ordinary rooms. Another difficulty in connexion with plenum ventilation was the regulation of the degree of heat. The plenum system or the warm-air system was very largely used in American houses, and he knew from the experience of friends of his that American houses were not always healthy, because they were frequently overheated, and the air was not always pure, because it was carried through the buildings in small ducts, which became dirty, and the air was thus tainted. Mr. Henman suggested that the external air might be purified, whereby it might be admitted in a purified state into our domestic buildings, but he (the speaker) was afraid that that would never be effected in towns.

Mr. H. P. G. Maule, who seconded the vote of thanks, said there were one of two points that naturally occurred to one in listening to such a paper. Take the case of an ordinary dwelling house: it seemed to him that it would be rather difficult to insert a ventilator of the kind Mr. Henman had shown in the walls of a dining-room or drawing-room, and he should like to know if Mr. Henman had any special method of dealing with an ordinary dwelling house where there was some architectural treatment of the walls. There was one point which seemed to be always overlooked, and that was the education of the public in the matter of appreciating fresh air coming into rooms through windows. If one accustomed oneself to live in a house with open windows, any other condition could not be tolerated for long. One learnt to appreciate purity and freshness of air so much that in entering a room one could tell at once whether the window was open or not. He ventured to say that he could go into a room with his eyes shut and could tell in half a minute whether the windows were open or shut, and that because he accustomed himself, winter and summer, to wide open windows, and he thought that architects, in ordinary domestic work, were in error in providing anything like mechanical methods of ventilation. It was a matter of the education of the individual rather than the ventilation of the house by mechanical means. The point raised by Mr. Murray as to the cleansing of ducts seemed to be the crux of the Plenum system. Mr. Henman had said it was of the utmost importance that the flues should be kept clean, but, human nature being what it is, unless the flues were sufficiently large to enable people properly to clean them, they would in course of time most certainly become foul. If the extract of a room was by the fireplace flue and the inlet to the room was only half the size, surely the amount of ventilation one would get in the room, supposing the windows were shut, would be quite inadequate on the assumption that there were more than a certain number of people in it. If the number of people in a room was increased, there ought to be special provision for allowing more air to come in. He did not see how the insertion of one or two ventilators in the walls of a room would adequately ventilate that room unless the windows were opened too. The paper they had heard was a very interesting one, which they would want to turn to for information again and again.

Mr. W. J. H. Leverton asked Mr. Henman whether he found his methods of ventilation sufficient when gas was burning. In ordinary circumstances during the day, with the air coming in at an opening 2 ft. below the ceiling on the side of the fireplace, the air would be properly diffused, and would find its way out of the chimney, but with the ordinary gas burners creating fumes he was afraid that the arrangement recommended would not be sufficient.

Mr. Alfred Burgess said that Mr. Henman had made some very clear distinctions. A ventilator originally was a man who turned a wheel, and it was interesting to see how correct was Mr. Henman's statement that proper ventilation could not take place unless there was some mechanical force to aid it. In mechanical ventilation there were really three processes which might be adopted, and he did not agree that a system of propulsion and extraction would not work satisfactorily. The conclusion of the committee appointed to consider the ventilation of the House of Commons was that the ordinary propulsion of air into a building should be assisted by extraction. Almost every mechanical system of ventilation was apt to be called a plenum system, and it was necessary to define the three processes he had referred to. There was the system which consists in putting air into a building at an excess of pressure on that outside the building; there was also that system of drawing air through a building so that a slight vacuum might be created; and there was the conjunction of the two, which was used in the House of Commons, *i.e.*, putting the air in at one end by a fan and extracting it at the other. By this means they avoided excess of pressure and also a vacuum, and got instead an equilibrium, which was a good name for the third system. He thought it was a good thing that architects, when discussing mechanical ventilation, should make use of definite terms in regard to the different systems which they were describing.

Mr. A. Needham Wilson asked Mr. Henman what he thought the height of rooms should be in houses where the system of ventilation he favoured was adopted. One of the difficulties one had to deal with was that the average client insisted on excessively high rooms, and Mr. Henman's conclusions quite disposed of the idea that high rooms were necessary for their efficient ventilation. Mr. Henman's statements seemed rather to reverse the accepted order of things; if we want to let out foul air from rooms we must open the windows at the bottom, and if we wanted to let fresh air in we must open them at the top.

The President, in putting the vote of thanks to the meeting, said that two things had struck him in the course of the evening. It was cheering to hear from an expert like Mr. Henman that the much-abused open fire was still a satisfactory means of ventilating a room. They had heard so often about its wastefulness, and that we ought to use stoves and radiators, that it was pleasing to hear for ordinary dwelling rooms we could make use of the open fire. With regard to the ventilator, a model of which Mr. Henman had shown, he understood it had to be put about 2 ft. from the ceiling and on the same side as the fireplace; but in most houses the fireplace being on the inner wall, he did not quite see how the ventilator was to connect with the open air when the chimney was in the centre of the house. As far as he could gather from the paper, the jerry-built house was the one most satisfactorily ventilated. Plaster made of mud and bricks made of sawdust produced a perfectly-ventilated house without any of these mechanical means!! Any mechanical appliance that depended on people for regulation and attention was bound to get out of order, for they would not be attended to. Under the new by-laws which were insisted on ventilators had to be put in, but as soon as any draught was felt the occupants invariably closed them, and depended on doors and windows for ventilation. There was one thing that was not insisted on sufficiently with regard to ventilation, and that was keeping walls and surfaces of rooms absolutely clean. There was no doubt that if a room was kept closed up for any time the walls would get dirty and foul, and the furniture too. To a certain extent he agreed with Mr. Maule about the open window, but it would be a difficult matter to persuade people in a city like London to keep open their windows. The great object seemed to be how to keep out the soot and dust and fog, which spoilt almost everything in a room.

The vote of thanks having been very heartily agreed to,

Mr. Henman, in reply, said that his experience had been contrary to that contained in what were called the recognised works on ventilation. He found that nearly everyone writing on the subject went back to Dr. Reid, and although Dr. Reid made the most careful experiments with the apparatus he was able to obtain in his day, nevertheless in regard to many of the important statements and the deductions he made he was scientifically wrong, and it was for that reason that he (the speaker) had put before them the particulars he had. He hoped he had given his reasons sufficiently clearly, and that they would be able to see that Dr. Reid was wrong in the conclusions he arrived at. As to the question of keeping the air channels, ducts, and flues clean, in any system of ventilation, mechanical or natural, it was a question of having the flues get-at-able; unless the flues were kept clean good ventilation could not be obtained. Flues should be so arranged that they could be swept, and "if they are arranged so that they can be swept, then sweep them." As to walls being pervious, and as to the amount of air that would come through, several experimentors had tried to ascertain this. It differed with every class of material and every surface put upon a wall, but it was surprising what an enormous amount of air came through the walls of an ordinary room. He had been in rooms where he had known that the bricks and materials were thoroughly pervious, and the air of these rooms had always been fairly sweet and clean. On the other hand, some thirty-five years ago he took an office on the walls of which was a thickly varnished grained paper, which, as he could not endure that sort of thing, he had painted a dark green. There was linoleum on the floor and the ceiling was painted, and so uncomfortable was the room that he had to give up the office for that reason. Air could enter only through cracks around the doors and windows, or by a special inlet over the door situated on the opposite side to the fireplace. It was one of the most uncomfortable rooms he had ever been in, stuffy without a fire and very draughty with one; and wherever you sat on a cold day you were in a draught, and you could not prevent it. The more you shut up the pores of a room, the more this would be so. Air would come in, and if it did not come through the materials it would come through cracks or windows, and cause a draught in its passage across the room to the chimney. He had told them that air heated in a flue

ascended because it was propelled upwards by the surrounding cooler air being attracted downwards by gravitation; the outer air was then pressing in all directions, seeking entrance to the room; if openings were few and of no great size, air would be forced in thin streams rapidly in direct lines to the fireplace, probably causing unpleasant draughts, and yet not efficiently ventilating the room. With larger openings more distributed, better results might follow, but with one or two properly constructed openings on the fireplace side about 2 ft. below the ceiling, the incoming air might be well distributed throughout the upper portion of the room, and would return towards the fire at low velocity from all parts much in the same way as it would if it came in through pervious walls, floor, and ceiling. As to propulsion and extraction being combined, it was one of the greatest of mistakes. It was a fallacy altogether, to begin with, that the two could be used economically. It was not effective. In connexion with this room they were occupying, if there were a propelling fan of sufficient power to force in a volume of air equal to a change throughout of, say, ten times an hour, all that would be necessary for doing it effectively would be to properly dispose and proportion the inlets and outlets. The addition of an extraction fan could not possibly help matters, it would simply entail extra expense; but supposing that the propelling power were not sufficient to effect the required change, then it might be supposed that supplementary power would be necessary; yet it should not be in the direction of extraction, because if air from the apartment were *forcibly* removed, other air must enter, additional to that supplied by the propeller, hence it must be drawn from somewhere else probably through casual cracks and crevices, resulting in draughts, or it may be sucked from impure sources. Under such conditions the ventilation of the apartment could not be said to be efficient. If, however, instead of supplementing a propelling power by one of extraction, the propelling power were augmented, better results might be expected, provided the inlets and outlets were properly arranged and proportioned. Propulsion and extraction could not be used together effectively. It had been done in the Houses of Parliament and the Law Courts, where the ventilating appliances were not sufficient, and extraction fans had been put in in addition to propulsion; but people complained of draught, and that was because the air was being drawn from some position from which it did not require to be drawn, and thus a draught was caused. Generally it was adopted as a makeshift; the original means provided having proved inadequate, supplementary power had been made use of, too often in the wrong direction. At the Victoria Hospital, Belfast, and at Birmingham Hospital the rooms were perfectly ventilated, at a considerable distance from the propellers, without any extraction whatever. As to the position of the ventilator he had shown that evening, when the fireplace was on the internal walls, generally there was a recess, and if the flue prevented the ventilator being placed on the chimney breast, then it could be put in the recess—as nearly central to the flue as possible, he said. In his own rooms he had put a ventilator on each side of the chimney breast, and he had been complimented on the efficient way in which his rooms were ventilated. As to the height of rooms, that was a point about which his clients rather laughed at him, but he had been pleased to find that a number of architects who had built houses for themselves had low rooms, but it had been suggested to him that that was because architects were not troubled with much money, and they had low rooms in order to keep down the expense. He was inclined to think that many of them realised that, provided there was not a lot of gas burning—gas fumes were a difficulty, but we were using electric light much more generally now—low rooms were better for comfort and good ventilation. They reduced the cubical capacity by having low rooms, and if they used a propelling force for ventilation it would cost less to change the air often with a small cubic capacity than if the cubic capacity were larger. Or the air at a given power could be made to pass through a small room more quickly than in the larger room. As to the height of the rooms, it was a question of taste, and it must depend on the size of the room to get the right proportion. He had to enlarge an old house, and the height of a room not half as large as the one they were then in was 7 ft. 4 in., and that did not seem an uncomfortable height, and a large class was held in the room. People had high rooms, he thought, because of gas fumes. If one mounted a ladder in a room in which gas had been burning some time, they would realise what a state the air got into, and all that foul air having no means of escape, had to come down in the ordinary way, but if the ventilator were at the upper part of the room the fresh air was constantly sweeping that away. Any opening, other than into the fireplace flue, served as an inlet for air whenever a fire was alight, and if the opening was high up in the fireplace, air only passed away by such an opening under most favourable conditions, and back flaps were necessary to prevent the egress of smoke from the fire. The air at the top of the rooms in his house was constantly fresh.

The Chairman announced that the next meeting will be held on November 25, when Messrs. J. T. Micklethwaite and E. Prioleau Warren would deal with the subject of "Excavations in Westminster."

The meeting then terminated.

THE SURVEYORS' INSTITUTION:

PRESIDENT'S ADDRESS.

THE first meeting of the new session of the Surveyors' Institution was held on Monday evening at No. 12, Great George-street, Westminster, S.W., Mr. H. T. Steward, President, in the chair.

Mr. Currey, Hon. Secretary, read a list of donations to the Library and the Library Fund, and on the motion of the Chairman a vote of thanks was accorded to the donors.

On the motion of the Chairman, Lord Armstrong, of Newcastle-on-Tyne, was elected an honorary member of the Institution.

The President then read his opening address, the first part of which dealt with the question of housing.

The Housing Problem.

He said that out of a total population of 32,678,213 persons in England and Wales, rather more than 15,000,000, or nearly one half, are dwellers in London and seventy-five other great towns. The towns have to find quarters on a limited space for nearly half the population of the Kingdom. London alone, with its 74,839 acres, has within it 4,536,541 persons, dwelling in 1,019,646 separate tenements, exclusive of the City proper. The recent census showed that of these 1,019,646 tenements 672,030 are tenements of fewer than five rooms, 149,524 being single room tenements, of which 60,421 were occupied by one person only, 48,341 by two persons, 23,680 by three persons, 11,279 by four persons, 4,001 by five persons, 1,257 by six persons, 384 by seven persons, 103 by eight persons, and 58 by nine or more persons. The latest returns available at the moment showed that eight of the principal companies have in their dwellings some 120,000 persons distributed approximately as follows:—

1. Metropolitan Association for improving the Dwellings of the Industrial Classes	6,000
2. Trustees of the Peabody Donation Fund	19,000
3. Improved Industrial Dwellings Company	29,000
4. Artisans', Labourers', and General Dwellings Company	42,000
5. Victoria Dwellings Company..	4,500
6. East-end Dwellings Company	5,600
7. The Four per Cent. Industrial Dwellings Company	4,200
8. Guinness' Trust	8,500

The Metropolitan Board of Works and the London County Council have made, or the latter body is in course of making, provision for some 70,000 persons, and the railway companies, and other commercial undertakings have provided under their Acts for about 15,000 more. The great landlords of London, and the Ecclesiastical Commissioners, and the borough councils have also materially aided in the erection of dwellings for the working classes.

With regard to the class of persons who occupy the dwellings provided, it was interesting to notice by the return of the London County Council that in thirteen of their schemes, out of 1,458 heads of families in their dwellings on December 31, 1899, there were persons of over 100 distinct callings, of which about half may be classified as artisans, presumably earning good weekly wages; while a considerable number of the other half belonged to the class of skilled labourers, but included 7 clergymen, 32 clerks, 73 policemen, 39 postmen, and 26 salesmen. While the population of London was, of course, increasing as a whole, it was satisfactory to find that the ratio of increase had declined in the last five decennial periods from 18·8 per cent. in the census period 1851-61, to 7·3 per cent. in the period 1891-1901. According to the last census the population of Shoreditch since 1891 had decreased 5 per cent., Finsbury and Westminster 9 per cent., Holborn 10 per cent., and the City 30 per cent., while the population of Chelsea, Bethnal Green, and Poplar had increased 1 per cent., Southwark 2 per cent., Islington 5 per cent., and Stoke Newington 7 per cent. The places in which a marked increase had taken place were Greenwich 20 per cent., Lewisham 45 per cent., Fulham 48 per cent., and Wandsworth 50 per cent. This increase was, however, only to have been expected, as there was vacant land in these parishes, and such districts would until quite recently have been deemed suburban.

In spite of the great increase in the facilities for locomotion and the cheapening of transit in recent years, and the disposition to remove factories to the suburbs, while London remains the centre of the life of the country, there must necessarily be a large number of the working class population who, not only by inclination desire to, but by the nature of their callings must, reside in the central districts. The working class population in these districts where, even under the best conditions, their surroundings must be of a somewhat depressing character, would be materially benefited by removal to an open or more cheerful neighbourhood where they might feel the influences of better surroundings, and it was to be hoped that the efforts of the London County Council in this direction might meet with the success they deserve. We must all have noticed the recent erection, in the nearer suburbs, of rows and rows of small flats or double tenement houses, of good exterior, and with internal fittings and conveniences beyond the dreams of twenty years ago. In these dwellings could be traced the influence of improved housing upon the habits of the occupants—in the rivalries in flower-beds and white lace curtains, and in general attention to external appearances; but they were, generally speaking, occupied by those in more or less regular employment at fixed wages.

As to lodging houses, in addition to those already provided, the London County Council was, he believed, about to erect a lodging-house of the superior kind for women on the south side of the Thames; while the Directors of Rowton House, he understood, have had the subject under consideration for some time past, and would, no doubt, as opportunity offered, erect one of their Rowton Houses for women. It was to be hoped that such a building might prove a success, and be the forerunner of others, as a house of the kind would be a great benefit to women, and should tend to prevent the overcrowding that at present exists in some parts of London. By overcrowding he did not mean the mere density of population. It was the overcrowding in particular rooms that was the evil. No doubt at the present time, in spite of the law, there were a large number of persons living in houses that were overcrowded in direct contravention of the Public Health Act, 1891. Putting the law in force often meant driving people to the streets or to the workhouses, and for this reason the magistrates hesitated to use the full powers of the law, and frequently decline to make closing orders.

Rural By-laws.

"Before I leave the subject of working-class houses," continued the President, "I should like to add a few words about the by-laws now pretty generally adopted in rural districts in so far as they affect cottages in the country or in proximity to towns. Many of the councils in rural districts, with, no doubt, laudable intentions, have adopted model by-laws with reference to houses framed on the London Building Act, a statute totally inapplicable to cottages in the country, with the result that landlords and others are discouraged from providing them, as the cost of building is altogether disproportionate to any return that can be obtained. It is worthy of note that one of the judges of the High Court has lately been, and I believe still is, in conflict with a rural authority upon the subject, and I trust this may lead to some alteration in the future by a remodelling of such by-laws as those to which I have alluded.

Increase in Parish Rates.

"The large increase in the parish rates of recent years is a matter of much concern to

many, and affects the question of housing. It is impossible to contemplate, without misgivings as regards the future, the state of things in boroughs like East and West Ham. In the former the rates have reached 8s. 8d. in the £, while in the latter they have arrived at the unprecedented amount of 9s. 8d., though Southampton and Wakefield run this close with 9s. in the £. I notice in the recently-published Report of the Public Works Loan Board that the outstanding advances of the Board to the Corporation of West Ham, in connection with the Education Act alone, represent something like the sum of half a million. The population of West Ham is largely dependent on works and factories which seem to show a tendency to migrate further afield, probably in order to escape the burden of such rates as these. Surely we must ere long reach, if we have not already done so, the limits of taxation. In the year 1874-5 the total Metropolitan rates stood at 4,271,538*l.*, and the outstanding loans at 21,009,799*l.* In the year 1900-1 the figures were, rates 11,740,329*l.* and outstanding loans 58,130,587*l.* This is a somewhat alarming increase, and it is not to be wondered at that some lending bodies, of which the Public Works Loan Board is the chief, are arriving at the conviction that the local indebtedness has, in some instances, now reached such a figure that the rates no longer afford a sufficient margin of security for advances of public money; indeed the Board has issued a warning to borrowers that future applications will probably not be entertained unless a reduction is shown in the rates levied. In pursuance of this policy, the Board has lately refused a good many applications from various boroughs and district councils in England and Wales.

Standard of Public Taste.

"I think everyone will admit that there are signs on every side of a general rise in the standard of public taste. While we may not have improved, speaking generally, upon the examples set us by Wren and Chambers in our public buildings, everyone must be impressed by the immense improvement in our domestic street architecture in recent years. All around us is rising a new and greater London. I cannot wholly agree with the President of the Architectural Association in his recent address, for I should be sorry to see the present picturesque irregularity of our street architecture superseded by the uniformity which characterises many of the much-lauded streets of Berlin. Let us have spacious streets and fine vistas by all means. These can be secured by a regulation of street lines, and the rest may be left to the general rise in the standard of public taste—with, of course, some control as to dealings with special sites. All will agree that the London County Council has done much to improve our modern London by the widening of our streets and the opening-up of new thoroughfares. The days are, I hope, far distant when London will be disfigured by monstrous steel frame erections like those of Chicago and Manhattan Island. We, too, have to deal with sites of enormous value, necessitating building to the utmost possible height, but, in common with some other cities, we have decided that there is a height beyond which buildings shall not go. If we should resort to steel frame buildings, as I think is quite possible before long, it will be for the sake of rapidity of construction and the saving of space; but if this is to be of any practical use some modification in the interpretation of our Building Act would appear to be necessary, for there can be no necessity, in a building supported entirely by steel construction, that the walls, which practically carry nothing but themselves, should be of the same thickness as though they carried many stories of superincumbent weight. The steel construction system, like most others, has no doubt some drawbacks and some advantages; but economy of material and the consequent saving of labour, as well as of space, would be the main advantages of the system. There seems to be a prejudice in this country against a large employment of ironwork in the construction of buildings, principally on the ground of its behaviour when exposed to great heat; but I do not think the last word by any means has been said on the question of fireproof construction and on the precautions that may be taken to protect ironwork from the effects of a conflagration.

The Building Trade.

"I fear it is true that the rise in wages in the building trade which has taken place during my memory does not alone account for the great increase in the cost of building during the same period, for it is undeniable that the rise in wages has been accompanied by a great decline in the quantity of work done by a man in a day. Take two oft-quoted cases for example, viz., the Westinghouse works at Manchester, where, it is said, the bricklayers laid 1,600 bricks a day per man on part of the works; and the case of the Great Northern Railway at Manchester, where the men, it is said, laid 1,760 bricks per man in hydraulic lime mortar in a nine hours' day. There were perhaps exceptional circumstances to account for such expedition; I do not know, but what we do know is that the bricklayer does not lay as many bricks in a day as he used to do, and it is declared by many who ought to know that 400 or 500 bricks per day per man is now regarded as a fair average, as compared with 800 to 1,000 bricks per day per man some years ago. The builders, with whom as a class I have perhaps a somewhat special acquaintance, have naturally attempted to counteract the combined influences of increased wages and decreased work by the adoption of every labour-saving appliance that presents itself. I have sometimes thought that a modern builder's yard might form a fascinating subject for a paper, for the extent to which manual labour has been displaced by machinery in many shops would be instructive reading. This has been done, not from any desire to injure the workman, but because the saving of time and the rapid turnover of capital are necessary to the existence of a business of the kind under modern conditions. It is for this reason, among others, that I think, as I have said, that we may some day see the adoption of American methods on a large scale. Strikes there will and must always be as long as human nature remains what it is, but the establishment of Boards of Conciliation for the London district has, I understand, done a good deal towards the immediate settlement of disputes, by bringing masters and men together in conference. These Boards have been the means of settling a considerable number of the irritating inter-trade disputes as to allocation of work, which have so often resulted in such serious losses alike to workmen, employer, and client. In cases where the dispute cannot be settled in conference, the Boards, under their constitution, can appeal to the Board of Trade. This arrangement is at present optional; but I understand that the men show a disposition to agitate for a compulsory reference in all cases of failure to agree. What this might come to mean under certain conceivable political conditions is too obvious for comment. As to the extent of the evil, I see from the handbook for 1904 of the London Master Builders' Association, that according to the General Report of the Labour Department of the Board of Trade there were no less than 39 strikes in the building trade in 1902 for an advance in wages, in which 5,356 persons were involved directly and indirectly, and which had an aggregate duration of 115,800 working days, representing an enormous sum as loss of wages. Anything which can be done to prevent such a loss must be to the real interest of all concerned. The decision in the Taff Vale case has deprived the men of one of their most potent weapons for enforcing their demands, but it must not be forgotten that it is two-edged, rendering the masters' associations as liable as the men's to actions for damages for anything done in their corporate capacity. This is not the place to comment upon this important judgment; but it is to be observed that even the champions of trade unionism admit its equity as a matter of abstract law.

Ancient Lights.

"While on the subject of the various causes which add to the risk and expense of building in towns, I will refer very briefly to the recent decision in the now famous case of Colls *v.* Home and Colonial Stores. It is too much to say, as some have held, that the judgment has put the law as to ancient lights on a clear and definite footing. The most that can be stated is that it has cleared the air by sweeping away many contradictory decisions. We now have it, on the highest authority, that some of the decisions were based on misconceptions of the effects of the Prescription Act, that, in some, findings of fact had been adopted as principles of law, and that in others, as the Lord Chancellor stated in his judgment, it had been erroneously assumed that there was inherent in the dominant tenement a sort of proprietary right in the light itself, whereas light, like air, is the common property of all to enjoy, and it is the exclusive property of none. By this judgment it is settled that an action will not necessarliy lie against the servient owner because, owing to his operations, the dominant owner has less light than before. There must be an actual and substantial deprivation of light, such as to make the premises less suitable—not for some special and extraordinary purpose, but for the ordinary purposes of men living together in crowded centres of population. It must, in fact, be a deprivation of such magnitude as amounts to a nuisance. It is held, further, that a mere diminution of light gives the party affected no right to an injunction, but merely a right to damages. As a result of this decision, we shall in future, I hope, have our eyes less often offended by the unsightly boards bearing the menacing words "Ancient Lights," which are apt to be used as a lever for virtual blackmailing in cases where persons are timid and fearful of the risks of an action at law. As members are no doubt aware, the councils of this Institution and the Royal Institute of British Architects have for some years past been so impressed with the necessity of relief by legislation to the servient owner that, with no little labour and expense, they had prepared a private Bill which, so far as its main provisions were concerned, would have had the same effect which has now been brought about by the recent interpretation of the existing law. But there still remains, in our opinion, the necessity for a special technical tribunal (for which we made provision in our Bill) composed of persons familiar with the difficulties or arrangement and construction which beset building operations in large cities and working on settled and consistent lines, for dealing with questions of fact. Before leaving this subject I should like to express our obligations to Mr. Howard Colls for the courage and persistence which he showed in fighting this matter to the bitter end, and the members will, I am sure, endorse the action of the Council in deciding to assist Mr. Colls in meeting the heavy costs he has incurred in a battle with an evil which threatened to obstruct greatly building operations in London and other large towns."

In conclusion the President referred to the retirement of Mr. Penfold, who, commencing from the earliest days of the Institution, filled the office of honorary secretary for thirty-six years, and to the election of Mr. Currey as his successor.

On the motion of Mr. C. Bidwell, seconded by Mr. Howard Martin, a hearty vote of thanks was accorded to the President for his address.

Presentation to Mr. Penfold.

The President said he had now to perform what was likely to be his most pleasing duty during his year of office. He found entered in the minutes of the Institution of July, 1868, the following:—"Resolved, that Mr. J. W. Penfold be appointed Hon. Secretary of the Institution." From that date until the end of last year Mr. Penfold continued to discharge the duties of that important office. The Council accepted his resignation last year with the greatest possible regret—for his was the guiding hand which had steered the Institution through the troubles and difficulites of its early career, and his wise counsel had always been at the command of the Institution. It was, therefore, felt that mere words were not adequate to express the feelings of the Institution or the the appreciation of the members of his services, and it was decided to give a more tangible expression of the regard in which he was held by asking him to sit to Mr. Jacomb Hood for a presentation portrait. Though no longer Hon. Secretary, Mr. Penfold had not been allowed to escape from the trammels and duties in connexion with the Institution, and they would still have the benefit of his wise counsel and advice. At the suggestion of the Council Mr. Penfold had been appointed to a position of "less freedom and more responsibility." He would not dilate on the esteem and regard in which Mr. Penfold was held, but he would express the earnest hope that he would be with them for many years to come.

The President then unveiled the portrait, and, in the name of the Institution, presented it to Mr. Penfold.

Mr. Penfold, in reply, said he was overcome by their generous recognition of any services he had rendered the Institution. He would

THE BUILDER, NOVEMBER 19, 1904.

"INK-PHOTO," SPRAGUE & Co. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DETAIL OF THE PRINCIPAL ENTRANCE, PISA CATHEDRAL.

sort of proprietary right in the whereas light, like air, is the common all to enjoy, and it is the exclusive none. By this judgment it is an action will not necessarily lie servient owner because, owing to ons, the dominant owner has less before. There must be an actual tial deprivation of light, such as to remises less suitable—not for some extraordinary purpose, but for the urposes of men living together in ntres of population. It must, in deprivation of such magnitude as a nuisance. It is held, further, diminution of light gives the party right to an injunction, but merely amages. As a result of this decision, future, I hope, have our eyes less led by the unsightly boards bearing ng words "Ancient Lights," which be used as a lever for virtual black- cases where persons are timid and the risks of an action at law. As re no doubt aware, the councils of ution and the Royal Institute of chitects have for some years past pressed with the necessity of relief tion to the servient owner that, ttle labour and expense, they had private Bill which, so far as its main were concerned, would have had effect which has now been brought the recent interpretation of the w. But there still remains, in our he necessity for a special technical for which we made provision in our posed of persons familiar with the or arrangement and construction et building operations in large cities ing on settled and consistent lines, g with questions of fact. Before his subject I should like to express tions to Mr. Howard Colls for the nd persistence which he showed in his matter to the bitter end, and the will, I am sure, endorse the action of il in deciding to assist Mr. Colls in he heavy costs he has incurred in a h an evil which threatened to obstruct uilding operations in London and e towns."

lusion the President referred to the of Mr. Penfold, who, commencing earliest days of the Institution, office of honorary secretary for thirty- and to the election of Mr. Currey as sor.

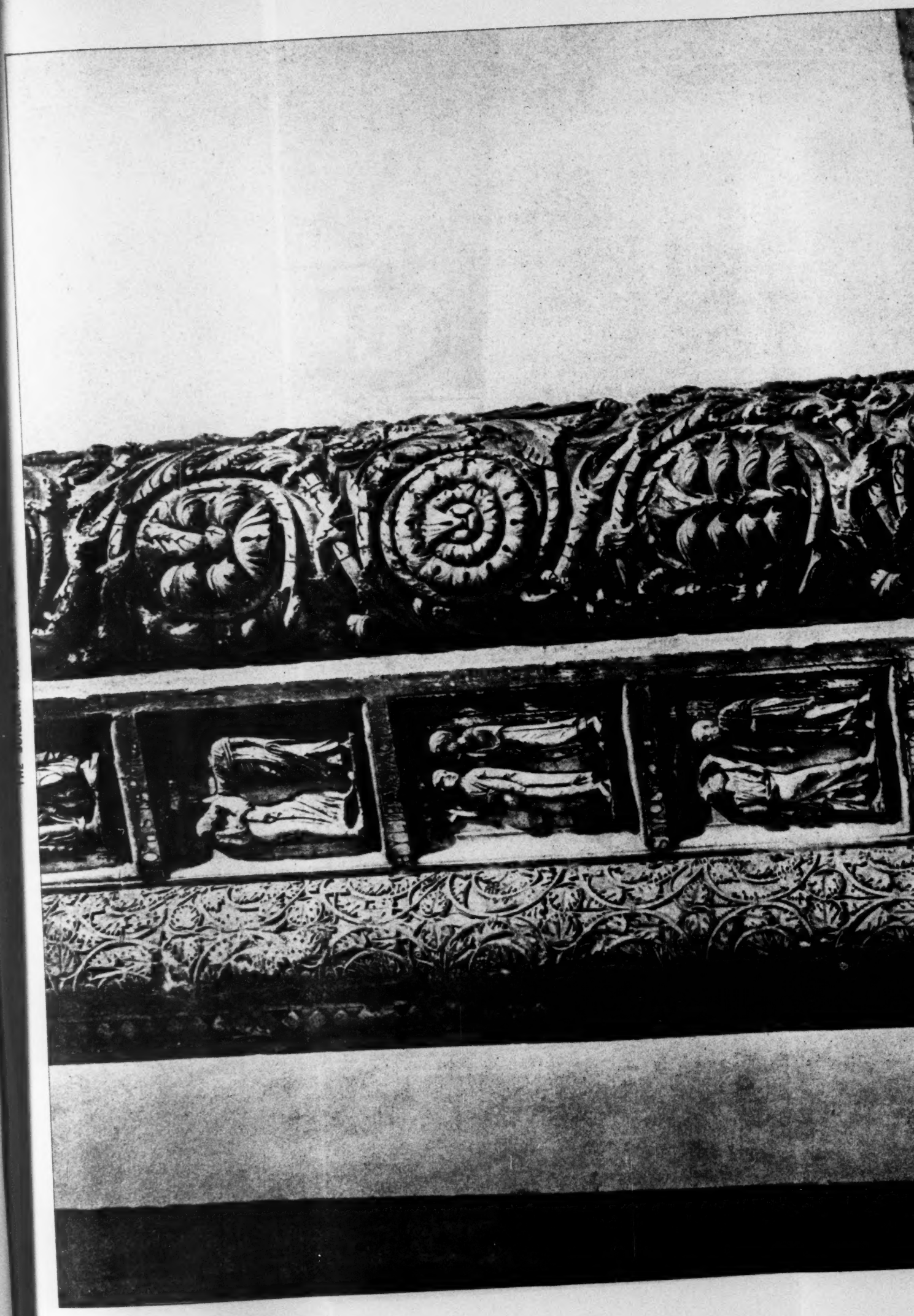
motion of Mr. C. Bidwell, seconded oward Martin, a hearty vote of thanks ded to the President for his address.

Presentation to Mr. Penfold.

esident said he had now to perform likely to be his most pleasing duty year of office. He found entered in es of the Institution of July, 1868, wing:—"Resolved, that Mr. J. W. e appointed Hon. Secretary of the n." From that date until the end r Mr. Penfold continued to discharge s of that important office. The ccepted his resignation last year greatest possible regret—for his was g hand which had steered the Institu- ugh the troubles and difficulites of areer, and his wise counsel had always he command of the Institution. It efore, felt that mere words were not to express the feelings of the Institu- he the appreciation of the members vices, and it was decided to give a gible expression of the regard in was held by asking him to sit to Mr. Hood for a presentation portrait. o longer Hon. Secretary, Mr. Penfold been allowed to escape from the tram- duties in connexion with the Institu- they would still have the benefit of ounsel and advice. At the suggestion uncil Mr. Penfold had been appointed ion of "less freedom and more respon- He would not dilate on the esteem d in which Mr. Penfold was held, uld express the earnest hope that he with them for many years to come.

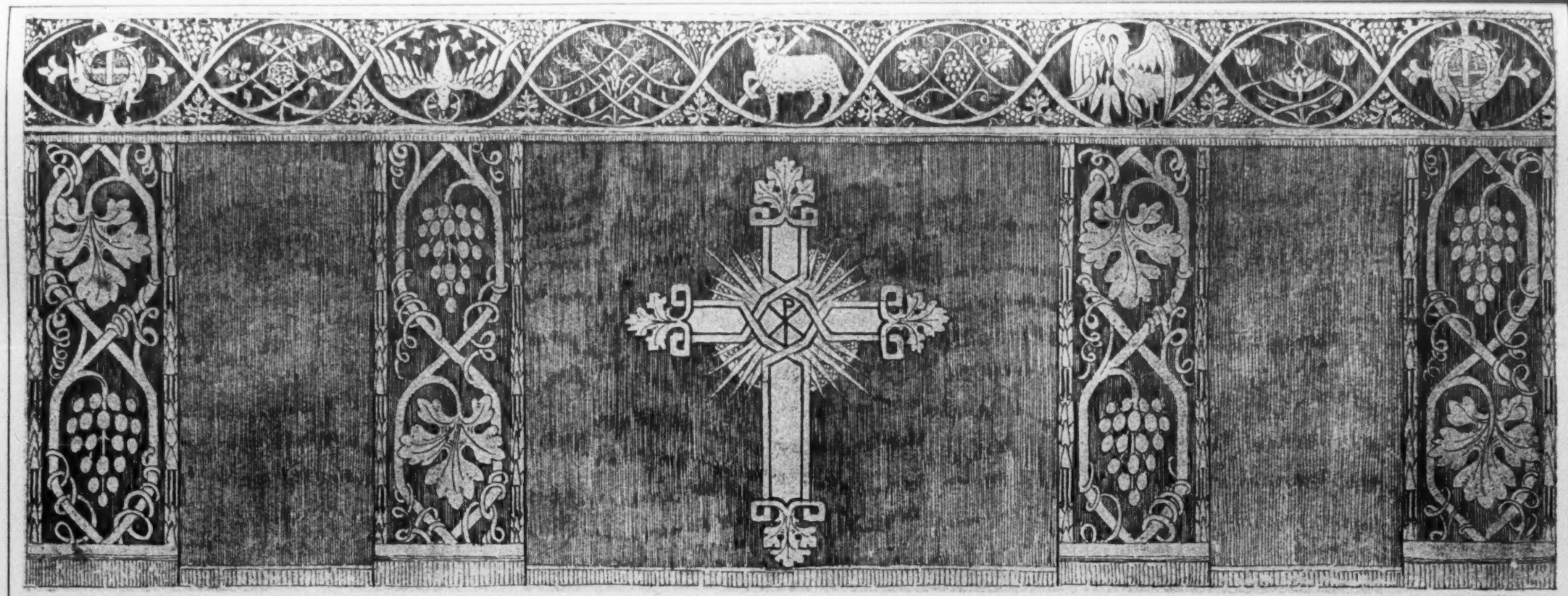
esident then unveiled the portrait, e name of the Institution, presented Penfold.

nfold, in reply, said he was overcome generous recognition of any services endered the Institution. He would



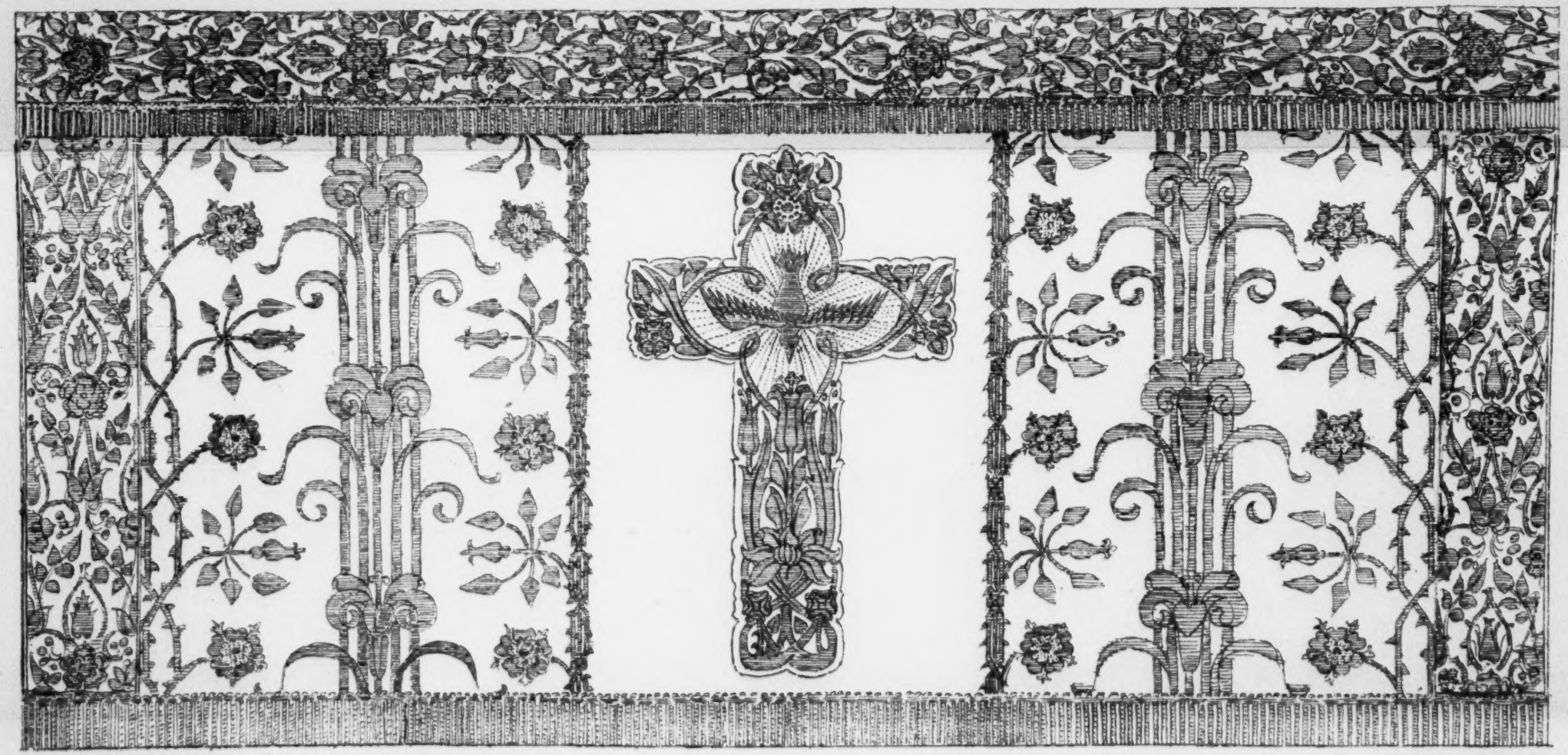
"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DETAIL OF THE PRINCIPAL ENTRANCE, PISA CATHEDRAL.



ALTAR FRONTAL, WOVEN IN RED AND GOLD BROCADE: FOR USE IN BUCKINGHAM PALACE CHAPEL.

ALTAR FRONTAL, WOVEN IN BLUE AND GOLD, FOR NORTH-WEST CHAPEL, ST. PAUL'S CATHEDRAL.



ALTAR FRONTAL, WOVEN IN WHITE AND GOLD BROCADE, FOR BUCKINGHAM PALACE CHAPEL.

"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

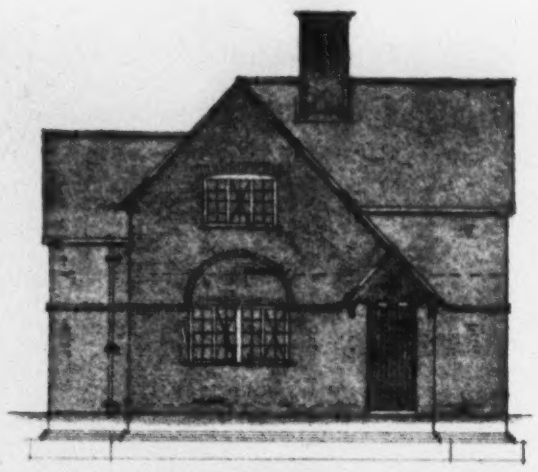
ALTAR FRONTALS.—Designed and Executed by Mr. Edmund Hunter.

"INK-PHOTO" SPRAGUE & Cº LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

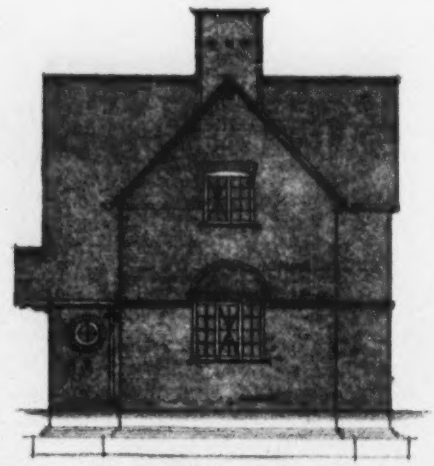
PROPOSED NEW OFFICES FOR THE NORTH-EASTERN RAILWAY COMPANY, COWLEY STREET, WESTMINSTER.

MR. HORACE FIELD, F.R.I.B.A., ARCHITECT.

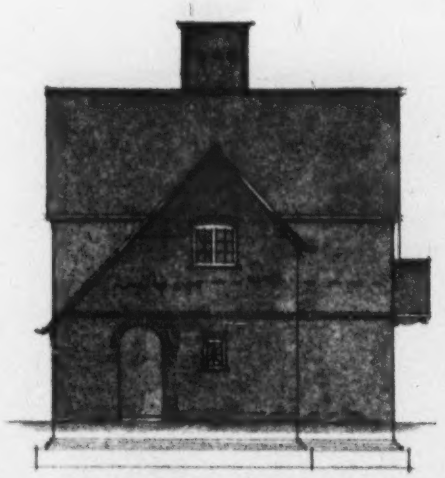
GARDENER'S COTTAGE
GTWARLEY RECTORY ESSEX
for THE REV J F TAPLETON



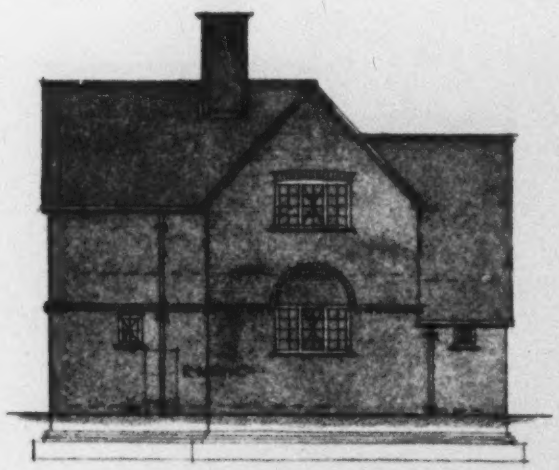
ELEVATION TO DRIVE



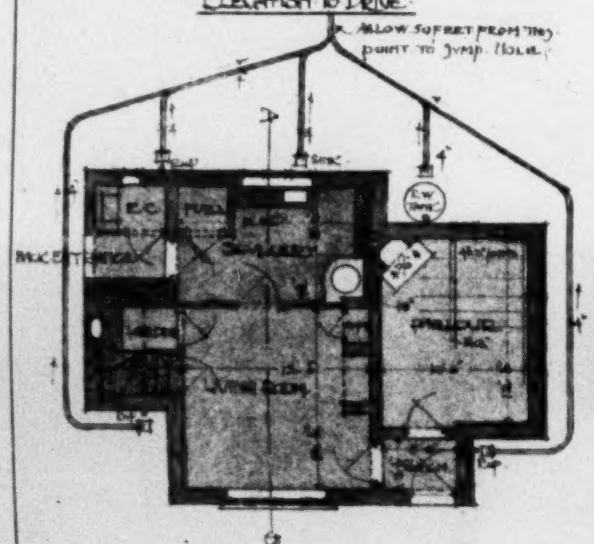
ELEVATION TO ROAD



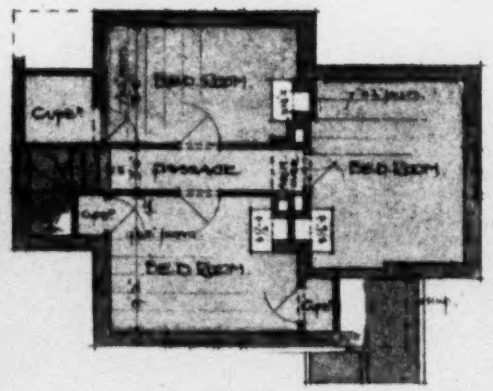
BACK ELEVATION



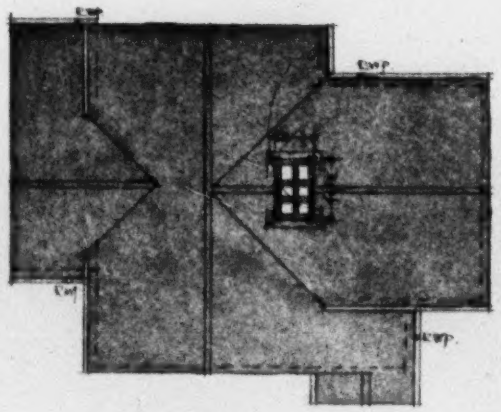
ELEVATION TO GARDEN



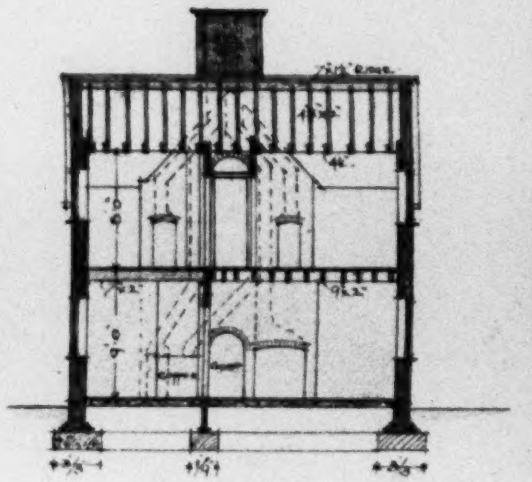
GROUND PLAN



FIRST FLOOR PLAN



ROOF PLAN



SECTION AB

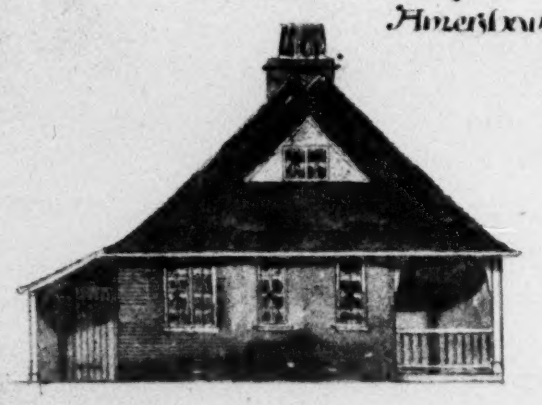
E. Guy Dawber Arch
22 Buckingham St
Adelphi Aug 30th 04

INK-PHOTO SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

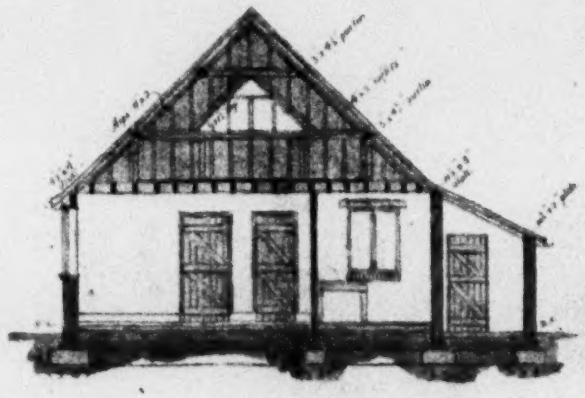
ARCHITECTURAL ASSOCIATION DISCUSSION SECTION: "ECONOMIES IN SMALL HOUSES."

Cecil B. Cave-Brown-Cave Esqre
Entrance Lodge,

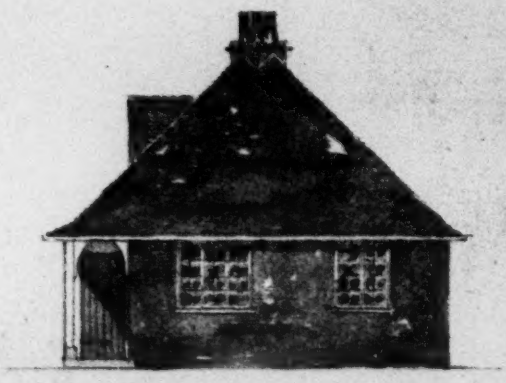
Cecil B. Cave-Brown-Cave Esq^re.
Entrance Lodge,
Amersham, Buckinghamshire.



Elevation to Road.

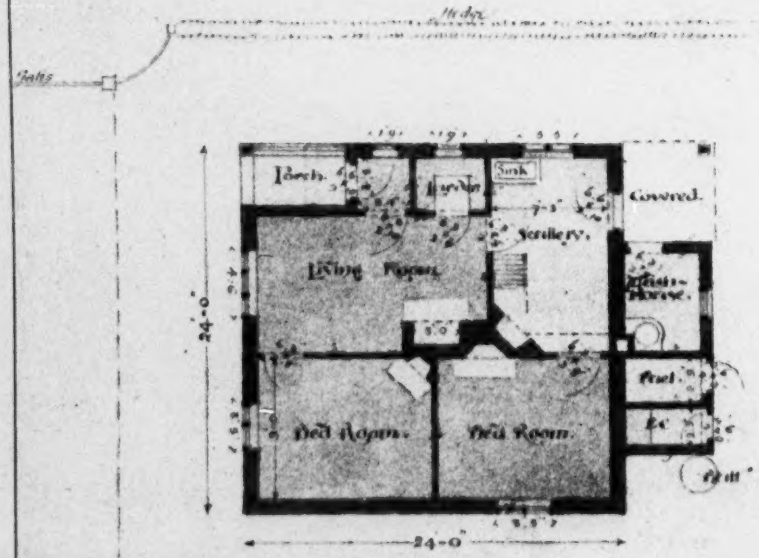


Section.

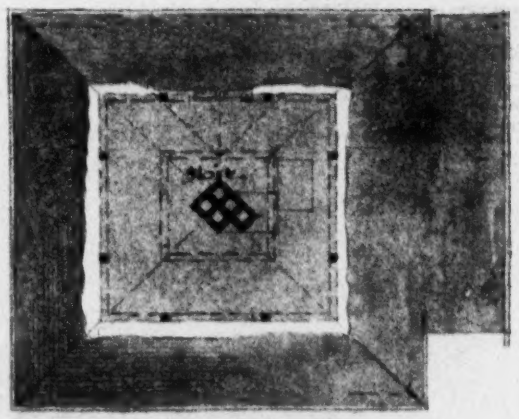


Elevation to Drive.

"Figures in red denote limited size of doors Windows marked with a X 6" open.



Ground Plan.



Attic Plan.

Back Elevation.

10 5 0 10 20 30 40 50

T. Phillips Legge, A.R.I.B.A.
Architect.
28 Mortimer Lane, E.C.

"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

"INK-PHOTO" SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

ARCHITECTURAL ASSOCIATION DISCUSSION SECTION: "ECONOMIES IN SMALL HOUSES."

always look back upon his tenure of the office of Hon. Secretary as one of the most pleasant experiences of his professional career, and he would always remember the very cordial relations which had existed between himself and the various Councils, and he thanked them for the kind way in which they had always listened to anything he had to say. In the early days of the Institution, when he was Secretary, reporter, editor, and accountant, etc., he came more into contact with the individual members, but since then the Institution had found in Mr. Julian C. Rogers, their Secretary, a most able and genial administrator of its affairs, and he took that opportunity of thanking Mr. Rogers, whose cordial friendship had made his (the speaker's) tenure of office most pleasant, and he also thanked the staff for their most cordial co-operation. He also thanked the members for the position they had just placed him in, and also Mr. Jacomb Hood for the portrait he had painted. He had one request to make, and that was that the Council would accept the picture and would place it somewhere in that room, as a companion portrait to that of his old and valued friend John Clutton.

The President said he was sure the Council would accede to Mr. Penfold's request.

The Secretary announced that the next meeting would be held on Monday, November 28, when a paper would be read by Mr. C. J. Mann on "The Building Surveyor: his Training and Practice."

The meeting then terminated.

Illustrations.

DETAIL OF THE PRINCIPAL ENTRANCE, PISA CATHEDRAL.

IT will be remembered that the Cathedral at Pisa was begun after the naval victories of the Pisans near Palermo. "The most famous Masters from foreign parts vied in lending their help to the building of such an important edifice, under the direction of Buschetto." The spoils from Palermo, Majorca, and elsewhere are built into the cathedral as integral parts of the design. It is therefore not easy to distinguish between the classic work and that of the XIth and XIIth centuries. There is no doubt that the founders of Gothic Sculpture were immensely influenced by the fine classical remains now in the Campo Santo at Pisa. We need to go no further than the South Kensington Museum to see this in the cast that is there in the architectural room of Nicolo Pisano's pulpit. Some of the figures in this are direct copies from the antique.

The pillar on the right, in our illustration, is a beautiful specimen of ancient work. The sculptures on the jamb, representing the origin of Christ from David, are probably the work of Diotisalvi, who built the baptistery about 1150. The smaller shaft is probably an antique of Græco-Byzantine workmanship, though no doubt many of the sculptors at work on the building were steeped in the influence of this style of ornament. The Cathedral is famous for its marble shafts, of which many are of *rosso antico*.

ALTAR FRONTALS.

THESE are examples of modern altar frontals commissioned from Mr. Edmund Hunter, of Haslemere, and designed and executed by him. We are unfortunately unable to give the colour effect, which counts for so much in work of this kind; but the drawings show clearly the feeling and character of the designs, and the notes beneath them as to the main colouring will enable the reader in some degree to estimate their effect.

From a note received by the artist at the last moment, we learn that the lower design on the page, which is described as made for Buckingham Palace Chapel, has in fact just been put up by him in the private chapel at Windsor Castle.

NEW OFFICES FOR THE N.E. RAILWAY COMPANY.

THE North Eastern Railway Company have been compelled to build new offices on a site in Cowley-street, Westminster, their present building in Great George-street having been acquired by the Government for the new Government offices.

The south front of the new building, here illustrated, is to be faced with red bricks from Messrs. Lawrence and Mr. Allen of Sudbury; light bricks for the quoins, darker bricks for the filling in, rising five courses to the foot. The stone is brown Portland.

The contractors for the work are Messrs. Holloway Bros. The architect is Mr. Horace Field, and the drawing was exhibited at the last Royal Academy exhibition.

COTTAGE, GREAT WARLEY; AND LODGE AT AMERSHAM.

THESE two designs, by Mr. Guy Dawber and Mr. Phillips Figgis respectively, formed two of the illustrations to the paper on "Economies in Small Houses" read before the Architectural Association Discussion Section by Mr. A. H. Belcher, and printed nearly in full in the present issue. They are referred to and described in the course of the paper.

THE METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of the Managers of the Metropolitan Asylum District was held at the offices, Victoria Embankment, on Saturday last week.

Millfield Homes.—The Works Committee reported that the total cost on completion of Millfield, Rustington, had been 24,234*l*. The cost had been increased on account of the Managers having to provide their own water supply. The homes accommodate 100 patients. Messrs. J. Parsons & Sons were the contractors for the work.

North-Eastern Hospital.—The Committee have ordered the renewal of some ceilings of this hospital at a cost of 408*l*. 10*s*. The work is being done by Messrs. Higgs & Hill.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring-gardens, S.W., Mr. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Kensington Royal Borough Council 7,600*l*. for street improvement, and Woolwich Borough Council 10,000*l*. for baths and wash-houses. Sanction was also given to Paddington Borough Council to borrow 5,833*l*. for contribution to reconstruction of Westbourne-park-bridge.

St. Louis Exhibition.—The General Purposes Committee reported the receipt of letters, dated October 22, 1904, from the Commissioner-General for Great Britain of the St. Louis Exhibition, stating that the International Jury have awarded to the Council a gold medal for its exhibit of the model of the shield used in the construction of Blackwall Tunnel, and that the chief engineer of the Council has been awarded a similar medal.

Selected Lists of Contractors.—On the recommendation of the Education Committee the name of Messrs. Walter Lawrance & Son, of Canal Works, Waltham Cross, was added to the selected list of contractors to be invited to tender for the erection of new schools and additions to schools; the name of Messrs. Chittenden & Simmons, of West Malling, Kent, was added to the list of contractors for tar paving the playgrounds of L.C.C. schools; the name of Messrs. J. Yetton & Co., of No. 4, Carr-street, Limehouse, was added to the list of contractors to be invited to tender for repairs to heating apparatus under the printed schedule of prices for heating works, and Messrs. Frank W. Harris & Co., Limited, of "Albion Works," Albion-grove, Barnsbury, were placed on the selected list of contractors to be invited to tender for carrying out structural alterations and repairs to school buildings to the value of 500*l*.

The London Building Act Amendment.—The following report of the Building Act Committee was brought up as a matter of urgency, and it was discussed at great length, together with the long report of the Committee on the Amendment of the Act, which we printed *in extenso* last week—

"We think it right to draw the attention of the Council to the fact that the suggested amendments to the London Building Acts which are outlined in the report of the Building Act Committee affect the work of many other committees of the Council. For instance, paragraph 7 of our recommendation deals with the provision of means of escape in case of fire and the reduction of risk of fire in buildings. The numerous fatal fires that have occurred in recent years (amongst others the fire in Judd-street on October 19, 1904, in which six lives were lost; in a restaurant in Duke's Head-passage, Ivy-lane, E.C., on February 25, 1904, seven lives lost; in Hackney-road, on October 18, 1903, three lives lost; in Brownlow-street, Holborn, on January 18, 1903, three lives lost; in Ben Jonson-road, Stepney, on December 29, 1902, six lives lost; in Queen Victoria-street, on June 9, 1902, ten lives lost) amply demonstrate the need for urgent action with regard to the question of safety from fire, and the Fire Brigade Committee have impressed upon us the necessity of every effort being made to obtain the sanction of Parliament at as early a date as possible to the proposals with regard to this matter. The suggested amendments which particularly affect the work of the Highways Committee are contained in paragraph 8 of our recommendation; those affecting the Improvements Committee in paragraph 4, and those affecting the Main Drainage and Public Control Committees in paragraphs 13 and 12 respectively. All these committees are submitting reports to the Council on Tuesday, November 15, 1904, stating that they consider that it is desirable that every effort should be made to obtain the sanction of Parliament at the earliest possible date to the suggested amendments with which they are particularly concerned. There are also very important amendments which affect the work of the Public Health Committee (paragraph 6), and also amendments suggested by the Local Government Committee (paragraph 5). These committees met too late to submit a report to the Council, but we know from the memoranda which they have sent to us that they are anxious that the sanction of Parliament should be obtained to their proposals as soon as possible. In view of the importance not only of the suggestions particularly affecting the work of the Building Act Committee but of those affecting the work of other committees of the Council, and of the urgent representations which have been made by those committees with respect to the suggested amendments affecting their work, we desire to express the hope that the Council will decide that every effort should be made to obtain in the session of 1905 the sanction of Parliament to our proposed amendments to the London Building Acts."

The following are the reports of the Fire Brigade Committee and the Highways Committee and the Public Control Committee respectively:—

"We have had under consideration the Building Acts (Amendment) Bill, 1905, so far as it relates to fire protection and means of escape in case of fire, and we observe that nearly all the suggestions which, after consultation with the late chief officer of the Fire Brigade and the present chief officer, we made to the Building Act Committee have been met in the Bill. These suggestions dealt mainly with, (*a*) the means of escape from buildings above a certain height, (*b*) fire protection and means of escape in premises used partly as shops and partly as dwelling-houses, with special provisions as regards premises used partly as oilshops, (*c*) fire protection and means of escape in premises part of which consists of projecting shops, (*d*) buildings over 80 ft. in height, (*e*) doors between buildings, (*f*) the storage of wood and timber and protection of neighbouring buildings, (*g*) the conversion of a dwelling-house into a factory, warehouse, etc., (*h*) the division of one shop into two or more shops, (*i*) the protection of windows and openings of buildings within 30 ft. of openings of other premises, (*j*) the protection of constructional ironwork, and (*k*) the construction of lift shafts. As a result of our consideration of the Bill we informed the Building Act Committee that we thought that the clauses with regard to projecting shops, the protection of windows and openings in buildings, and the protection of constructional ironwork should be retrospective after a certain period, and that the provisions with regard to the storage of wood and timber should be made more stringent in the case of timber yards adjoining dwelling-houses, but the Building Act Committee have not seen their way to make the necessary amendments. We are still of the opinion that we expressed in the joint report of the Building Act, Fire Brigade, and Parliamentary Committees, presented to the Council on May 26, 1903, that the need of further legislation with regard to protection against fire in and provision of means of escape from buildings is extremely urgent, and we therefore think that clauses dealing with the matters mentioned above should be proceeded with in the next session of Parliament."

"We have, at the request of the Parliamentary Committee, considered the provisions of the London Building Acts Amendment Bill, which the Council has decided to promote in the next session of Parliament, so far as they relate to tramways buildings. In connection with tramway work, we have experienced certain difficulties from time to time, owing to the limitations contained in the London Building Act, 1894, as to the cubical extent of buildings, and sections 80 and 81 of the Bill, as now submitted to the Council, will, we are of opinion, deal satisfactorily with that point. The size and special character of buildings used for electrical tramways made it extremely important that the exemptions in those respects accorded by section 203 of the London Building Act, 1894, to buildings of certain descriptions should be extended to tramway structures. In these circumstances, we desire to express the hope that every effort will be made to secure the passing of a Bill in the next session of Parliament to secure these objects."

"The Building Act Committee have been in communication with us on the subject of the suggested amendment of section 118 of the London Building Act, 1897, which prohibits the establishment, or the carrying on, of dangerous businesses at a less distance than 40 ft. from a public way, or 50 ft. from any other building or vacant land in other ownership. Proposals which have from time to time been made to establish such businesses in the County of London have had to be abandoned owing to the difficulty of complying with that section, but it appears to us that many of the businesses might be conducted with safety under proper supervision, and subject to proper conditions imposed in a licence. We have therefore suggested to the Building Act Committee the desirability of applying to Parliament for powers enabling the Council to consent, in such cases as it may think fit, to the carrying on of dangerous businesses within the county. We are of opinion that the draft clauses embodied in the Bill prepared by the Building Act Committee will give effect to our views, and we consider that every effort should be made by the Council to obtain the sanction of Parliament to the proposals at the earliest possible moment."

Upon the reception of the report,

Mr. Thomas asked why the Borough Councils had had no opportunity of considering the proposals?

Mr. Stuart Sankey said he had received a letter from the City Solicitor stating that he had written to the Council to ask that the draft Bill should be sent on to the City Corporation for their consideration. Nothing, however, had been done in that direction, and therefore the City could offer no opinion.

Captain Hemphill said they had written to the Borough Councils asking for their suggestions for the amendment of the Act. There would be no difficulty in sending them a draft of the Bill.

Mr. A. M. Torrance, Mayor of Islington, said they had not had the draft Bill asked for.

Captain Hemphill, chairman of the committee, moved the adoption of the Report. He proceeded to give a history of the origin and fate of the last Bill presented in 1902-3. The committee, he said, subsequently wrote to the Corporation, to the Borough Councils, and to the building authorities, including the Royal Institute of British Architects, to ask for suggestions in regard to a proposed amending Bill. The result had been a mass of valuable information, especially from the Royal Institute of British Architects, which contained many useful suggestions. They eventually sent 245 suggestions to the Parliamentary Committee for embodiment in the Bill. Having sent these proposals to the Committee, they—the Building Act Committee—proceeded with their proposals. The draft Bill was now in existence. It was not one for restrictions only, but granted concessions. It proposed for one thing to allow buildings of larger cubical space to be erected in London; and enabled the Council to approve buildings constructed of iron and steel and concrete. They also proposed to allow local authorities to supervise and control buildings under a certain size, and they dealt effectively, he thought, with the question of fire-resisting materials. They only asked the Council to approve definite principles. He did not suggest that the Council should be bound that day to every detail in the measure. They only wanted an assent to the general policy. The draft Bill must be deposited on December 17, and between that date and the middle of February there would be plenty of time for the local authorities to discuss the details of the Bill, which could be settled definitely by the Council itself before the end of January. The Council would then have ample opportunity for discussing the amendments and suggestions made by the local authorities. He thought it would be a great pity if the Bill was not approved that day, considering the time spent on preparing the measure, and especially the fact that they had dealt very carefully with the suggestions which had reached them from outside.

Dr. Napier moved the following amendment:—

"That, whilst fully recognising the necessity of amending, at an early date, the London Building Acts in many important particulars, the Council is of opinion that, having regard to the number and magnitude of the proposed amendments, to the fact that they have not been submitted to and considered by the professional bodies and local authorities (in accordance with the practice hitherto adopted, and which the Building Act Committee in their report to the Council on June 14, 1904 (p. 989), implied would be followed), and to the further fact that the proposals of the Council for legislation in the next Session of Parliament are already both numerous and important, it is undesirable to proceed with the proposed amendment of the London Building Acts in the next session of Parliament; but that such proposals be referred back to the Building Act Committee for further consideration, with a view to legislation being sought in the session of 1906."

He said he hoped that the Council would not be misled by a suggestion that in giving the Parliamentary notices they were not committing themselves to the principal details of the Bill. The Act of 1894 when introduced consisted of 192 sections. It was really a consolidation of old Acts. The Bill of 1904 was not of that character; but introduced new laws and new proposals, which raised considerable opposition. The Bill of 1894 took twenty-two days before the Commissioners of Parliament, and he ventured to think that this Bill would take double that time. The Bill now before them needed at least five months' examination by the local authorities. The Building Act Committee had not given one-thirtieth part of the time they should have done to the consideration of the Bill. Finally, the local and professional bodies had not been properly consulted. They were asked in effect: How would you amend the Building Law? Now that was not what they wanted. They wanted the Bill in order to consider the actual proposals to be made. The surveyors and architects of London knew more about the Building Law of London than any member of the Building Act Committee. They would have, without the Building Bill, eight highly contentious measures. If they carried the Committee's Report, and if the Parliamentary Committee were compelled to go on with the Bill, some of the measures he had mentioned would suffer. He believed that they could not get the Bill through the next session.

Mr. Shepheard, in seconding the amendment, said it was impossible for anyone who did not devote days to studying the Bill to understand what it meant. It was a Bill of 179 sections, and, he ventured to say, would raise up in opposition all vested and individual interests, creating a hostility against which it would be useless to fight. The Bill proposed that the Building Act should apply to Government property. Did they think they could get that clause passed? Then the Bill attacked the magistrates. They proposed to ignore the duties of magistrates in respect to dangerous buildings and new streets. They were going to attack the rating authority. They were "going for" the district surveyors, proposing to pay those officials by salary instead of by fees. They were to be the servants of the Council, instead of independent officials. Summonses which were issued by the district surveyors were to be issued by the Council, and, as these summonses averaged 1,000 a week, they would need a bigger staff. They were asking Parliament to abrogate its functions by making streets wherever they liked. In effect, they proposed to pull down houses just where they liked. Then they attacked the Tribunal of Appeal—one of the safeguards of the Act. They proposed that no practising architect or surveyor should sit on the Tribunal of Appeal. They were dealing for the first time with churches and chapels by insisting upon bolts and swing doors. Not content with taking people's property, they were going to alter the Lands Clauses Act. The 10 per cent. for compulsory purchase was deleted, and they wanted forecourts to be dedicated to the public. In old streets it had been held by law that if an owner re-erected a low house he could re-erect the house to the same height as his neighbours'. The Bill was drastic and offensive, and it was absurd to ask them at one sitting to pass a measure of this character. Let them use this time between now and a year hence in getting all public opinion together, so that they might be able to present a Bill which would have the deliberate opinion of London behind it.

Mr. John Burns, M.P., said that in the interests of the public they should go on with the measure. Passing on to discuss the question of narrow courts, Mr. Burns said that Angel-court in the City was not more than 6 ft. 6 in. wide. They suggested that as an escape could not get up such courts, the people should have a trap-door, so that they might escape. House-owners in the City did not mind the expense. As to District Surveyors, a man spent the other day 1s. 3d. in putting in a bit of cement in a crack in the steps of his front-door, and the surveyor's charge was 19s. 3d., and there were other similar cases.

Mr. Alderman Alliston said it was not a question of this Bill or no Bill. They were agreed that there should be a Bill. They were also anxious that precautions should be taken against the risk of life by fire. The Bill, however, which was of a very drastic character had not been considered by the local authorities. They had heard a good deal of the protection of buildings, but nothing about the people. Who was to pay for carrying out this Bill, which would improve London off the face of the earth? If it were passed it would mean the reconstruction of London within the next seven years. How could a business man live if that was the case? Lawyers, architects, and surveyors would reap a fortune. He did not think that sufficient consideration had been given to the proposals, which would adversely affect the leaseholder and tenant, however much expense the owner might be called upon to bear.

Colonel Rotton said he could very well remember the inquiry as to the Cripplegate fire. Then, as the chairman of the Fire Brigade Committee, he was looked upon by the City representatives and officials as one who was more or less responsible for the fire. Bearing in mind the remarks of the City members when fires occurred, he would be no party to shielding City merchants when there was a question of saving life.

Mr. Howell J. Williams complained that the Council had not sent the draft Bill to the authorities for their consideration. The architects and builders were not opposed to an amendment of the Building Act. They would welcome an amendment, but it was necessary, before such a despotic power was given into the hands of the Building Act Committee, that they should have the full light of public criticism. At present they were proposing to raise a hostility for which there was no necessity.

Mr. R. C. Phillimore said that the deputy chairman had told the Council that they ought to consult the business man in the City. That was quite right, so far as it went, for there was already too much power in the hands of the professional bodies.

Mr. E. Smith (Chairman of the Fire Brigade Committee) remarked that some of the proposals put forward by his Committee were far more drastic than those which the Building Act Committee recommended. They put life before wealth, and were determined to go on with the thing.

Mr. E. White, said that while having no desire to look after the interests of the moneyed classes, he felt that to go on with the Bill now was to court certain defeat. The Bill ought to be sent to the various local authorities and the Institute of Architects and the Surveyors' Institution, and if this was done a great many of the present difficulties could be got over.

Mr. H. R. Taylor said that two years ago, when a small Bill was brought before the Council, they were asked to withdraw it in favour of a complete Bill. Now these same members said that the Bill was too big.

Mr. Jephson said the Bill was not merely a fire-prevention measure, but one designed to improve the public health. He appealed to the Council to push it forward.

On a show of hands the amendment found 25 supporters and 62 opponents.

A division was then demanded, when there voted: For the amendment, 27; against the amendment, 75.

The Council afterwards approved the recommendations.

A New Fire Station.—The Fire Brigade Committee presented a report recommending the Council to take steps for the erection of a new fire station in place of the present Waterloo-road Station, at an estimated cost of between 24,700*l.* and 26,000*l.* The recommendation was agreed to.

Tramways.—The Highways Committee recommended that the Standing Orders be suspended in order that application may be made to Parliament next Session for powers to construct tramways over Blackfriars and Waterloo Bridges and along the Victoria-embankment.

Mr. Sankey hoped the Committee would reconsider the proposal. He had no mandate to speak on behalf of the City Corporation, but he knew the question was being considered by a Committee of that body.

Mr. Wightman felt that it would be better to stop the Lord Mayor's Show or a Royal procession occasionally by having the tramways, rather than have the daily procession of poor people walking over the bridges from the South of London.

Mr. Alliston supported the proposal, as he considered it an absolutely necessary tramway. At the same time, an assurance ought to be given the City Corporation that this was to be a scheme in itself, and was not to be made a stepping stone for tramways through the narrow streets of the City.

The recommendation was agreed to.

The Preservation of Garden Squares.—The Parliamentary Committee submitted a report dealing with the preservation of garden squares and enclosures, and recommended: "That Parliamentary authority be sought in the Session of 1905 to secure that the garden squares and enclosures in London shall be permanently preserved as such, and that such garden squares and enclosures when so preserved shall be free from any future legislation relating to the taxation of ground or site values."

Mr. H. P. Harris said he thought the Council was entitled to more information on the matter, more particularly as to what squares were scheduled in the Bill.

Dr. Napier replied that the owners of about half the squares in London were friendly to the Council, as was the Chancellor of the Exchequer as the head of the Woods and Forests Department.

The recommendation was carried.

Long-grove Asylum—Erection of superstructure.—The Asylums Committee reported as follows:—

"In pursuance of the promise of our chairman to submit to the Council further information as to the estimate for the erection of the superstructure of the Long-grove Asylum, we now report as follows:—

The amount of the accepted tender (that of Messrs. Foster & Dicksee) is		£359,892 10 0
The architect's cube estimate was	£338,000 0 0	
To which must be added for "foundations" of some of the detatched buildings omitted from the foundation contract and included in the superstructure contract	10,000 0 0	
		348,000 0 0
Showing the amount of the tender in excess of the architect's cube estimate to be		11,892 10 0
The estimate of the quantity surveyors (based on priced bills) obtained at the request of the Finance Committee amounts to		389,119 17 3
Deduct amount of accepted tender.....		359,892 10 0
Showing the excess of the quantity surveyors' estimate over the accepted tender to be		£29,227 1 3

'In the event of the Committee having contemplated the execution of the work by the Works department, in accordance with the standing orders of the Council, they would have had to obtain an estimate from the proper officer, and, before reporting to the Council, to have referred such estimate, together with full plans and specifications, to the Works Committee for consideration. The estimate, therefore, that would have been submitted to the Works Committee is that prepared by the quantity surveyors referred to above. As shown the tender accepted by the Council, viz., that of Messrs. Foster & Dicksee, amounted to 359,892*l.* 10s., is 29,227*l.* 7s. 3d. less than the quantity surveyors' estimate."

Housing.—The Housing of the Working Classes Committee reported that all the tenements in Barnaby-buildings, Leroy-street, Bermondsey, are practically completed. The dwellings have been provided for the purpose of rehousing 291 persons of the working class who will be displaced by the carrying out of the Long-lane and Tabard-street improvements, and the two blocks together contain accommodation for 400 persons in 40 tenements of two rooms, and 40 tenements of three rooms each.

The Council, adjourned shortly before eight o'clock.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

The London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Kensington, South.—A deviation from the plan approved on April 26, 1904, for the erection of an electrical transformer station on the site of Nos. 1 and 3, Pelham-street, and Nos. 1 and 2, Thurloe-houses, Thurloe-square, Kensington, so far as relates to an alteration in the frontage line in Pelham-street (Mr. L. W. Green for the Metropolitan District Railway Company).—Agreed.

Lewisham.—Three houses, with one-story shops in front, on the site of No. 63, Dartmouth-road, Forest Hill, and the erection of additional stories over the existing shops to Nos. 55 and 55a, Dartmouth-road (Mr. E. C. Christmas).—Consent.

St. George, Hanover-square.—That the application of Mr. T. Worlock for an extension of the period within which the erection of two iron and glass shelters at the St. George's Union workhouse, to abut upon Wallis-yard, Buckingham Palace-road, St. George, Hanover-square, was required to be commenced, be granted.—Consent.

Brixton.—That the application of Mr. A. Bourne for an extension of the periods within which the erection of a three-story addition to the Stockwell Training College on the north-east side of Stockwell-road, Brixton, was required to be commenced and completed, be granted.—Consent.

Finsbury, Central.—Two projecting porches to a proposed factory on the site of Nos. 51 to 71 (odd numbers) inclusive, Collier-street, Pentonville (Mr. S. D. T. Pettit for Messrs. Everett & Co.).—Consent.

Fulham.—Projecting porches with balconies over and barge boards at Nos. 41 to 79 (odd numbers), Finlay-street, Fulham (Mr. A. Dawkins for Mr. R. B. Mason).—Consent.

Hackney, South.—The retention of a wood, iron, and glass porch at the workhouse, Sidney-road, Homerton (Mr. F. R. Coles for the Guardians of the Hackney Union).—Consent.

Marylebone, East.—A house with projecting porch and bay windows on a site abutting upon the southern side of St. Edmund's-terrace and eastern side of Avenue-road, St. Marylebone (Mr. A. F. Faulkner for Mr. W. Willett).—Consent.

Poplar.—Projecting porches at the Primitive Methodist Chapel, Manchester-road, Cubitt Town (Mr. H. Harper).—Consent.

Wandsworth.—Retention of four houses on the east side of Burstock-road, Putney, northward of No. 21 (Mr. T. G. Rutherford).—Consent.

Wandsworth.—One-story shops in front of Nos. 98, 100, and 102, Lower Richmond-road, Putney (Mr. J. Durham for Mr. A. Welham).—Consent.

Westminster.—A projecting porch, steps, and angle turret at Hopkinson House, Vauxhall Bridge-road, Westminster (Mr. R. S. Ayling for the Brabazon House Company).—Consent.

Lewisham.—That the application of Mr. A. H. Kersey for an extension of the periods within which the erection of houses with bay windows on the west side of Brockley-rise, Lewisham, was required to be commenced and completed, be granted.—Consent.

Dulwich.—Two two-story bay-windows at No. 73, Camberwell-grove, Dulwich (Mr. F. Banister for Mr. H. W. Haile).—Refused.

Hackney, South.—That the Council do not accede to the request of Messrs. W. Silk & Son for permission to retain a showcase on the forecourt of No. 20, Urswick-road, Homerton).—Refused.

Hampstead.—An iron and glass covered way at No. 14, Buckland-crescent, Hampstead (Mr. J. P. Hamilton).—Refused.

Stepney.—A projecting hood over the entrance to "Court House," Holloway-street, Commercial-road, Stepney (Messrs. Joseph & Smithem for the Council of the United Synagogue).—Refused.

Width of Way.

City of London.—Re-erection of buildings on the western side of Cross Key-court, London-wall, City (Mr. A. Griffin for Mr. G. J. Mathieson).—Consent.

Hampstead.—Additions to "The Whins," North End-road, Hampstead, with a boundary fence at less than the prescribed distance from the centre of the roadway of the street (Messrs. Grayson & Ould for Mr. W. H. Lever).—Consent.

Holborn.—Working-class dwellings on a site abutting upon the south side of Summers-street and west side of Back-hill, Holborn (Mr. A. T. Quartermain for Mr. A. J. Best).—Refused.

Width of Way and Line of Frontage.

Marylebone, West.†—A scullery and entrance hall addition, projecting steps, and hood in front of No. 22, Hill-road, St. John's Wood (Mr. S. A. Tatchell for Mr. E. A. Benjamin).—Consent.

Width of Way and Space at Rear.

Southwark, West.—A two-story building upon the site of No. 108, Broadwall, to abut also upon Roupell-street (Messrs. J. Hoare & Son for Mrs. A Hoare).—Consent.

Space at Rear.

Battersea.—A modification of the provisions of section 41 of the Act, so far as relates to the proposed erection of club rooms on a portion of the open space about "The Cedars" clergy house, High-street, Battersea, to abut upon Orville-road (Mr. J. S. Quilter for Canon J. Erskine Clarke).—Consent.

Southwark, West.—A modification of the provisions of section 41 of the Act, so far as relates to the proposed erection of a cart-shed with four stories over, on the east side of Gravel-lane, Southwark, to extend over part of the open space at the rear of a stable building on the north side of Orange-street (Mr. E. Carritt for Mr. J. Sainsbury).—Consent.

Paddington, South.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building at No. 32, Westbourne-grove, Paddington (Mr. A. Young for Mr. J. Rossdale).—Refused. (That the applicant and the District Surveyor be informed that if it be proposed to unite Nos. 30 and 32, Westbourne-grove, it will be necessary to bring the united building into conformity with the provisions of section 74 (2) of the Act.)

Deviation from Certified Plans and Projections.

Chelsea.—The construction of an additional story and a projecting angle turret to the Cadogan Hotel, Sloane-street, Chelsea (Messrs. Brown & Barrow for Mr. T. Lassam).—Refused.

Formation of Streets.

Clapham.†—That an order be issued to Mr. J. Donkin sanctioning the formation or laying out of a new street for carriage traffic to lead from Kendoa-road to High-street, Clapham (the late T. G. Foster).—Consent.

Wandsworth.—Permission to retain barriers across Ellerton-road, Burntwood-lane, Wandsworth (Messrs. Holloway Brothers).—Consent.

Buildings for the Supply of Electricity.

Woolwich.—Floors of an addition to the engine-room at the electric-light station, Globe-lane, Woolwich (Mr. F. Sumner for the Council of the Metropolitan Borough of Woolwich).—Consent.

Height of Buildings and Means of Escape at Top of High Buildings.

Kensington, South.—A building on the north side of High-street, Kensington, at the corner of Brown's-buildings (Mr. P. E. Pilditch).—Consent.

Deviation from Certified Plans.

Whitechapel.—Deviations from the plan certified by the District Surveyor, so far as relates to the proposed erection of buildings upon the site of Nos. 2, 4, and 6, Old Montague-street, and a portion of the site of "The Archers" public-house, Osborn-street, Whitechapel (Messrs. Turner & Holditch for Mr. A. C. Turner).—Consent.

Widening of Streets, Width of Way, and Line of Frontage.

St. Pancras, North.—A building upon the site of Nos. 9, 11, 13, 15, and 17, Highgate-road, St. Pancras, to abut also upon Greenwood-place, and in connexion with such building the widening of a portion of Greenwood-place (Mr. G. H. Greatback for Mr. W. A. Curnock).—Refused.

Working-class Dwellings.

Limehouse.—Dwelling-houses to be inhabited by persons of the working class on a site to the northward of the Rotherhithe-tunnel approach, between Rose-lane and Butcher's-row (Mr. R. Robertson for the Housing of the Working Classes Committee of the Council).—Consent.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS.—The ordinary monthly meeting of the Sheffield Society of Architects and Surveyors was held on the 10th inst. in the Lecture Hall of the Literary and Philosophical Society, Leopold-street, Mr. T. Winder presiding. A ballot was taken, and the following gentlemen were elected Associates of the Society: Messrs. S. S. Smith and G. H. Rawcliffe. A lecture was then delivered by Dr. John Stokes on "Monumental Brasses." In the course of his remarks he said that monumental brasses made their appearance in England in the XIIIth century, the earliest now in existence being that of Sir John d'Abernon, of Stoke d'Abernon, Surrey, dated 1277; earlier ones now lost are recorded. This form of memorial probably first arose in Germany, and seemed to have sprung into existence as a perfect art, for the earliest examples were best in execution and design. The material of which they were made was known as "latten," a term loosely used to designate any compound of copper, and also as "Cullen plate," a corruption of Cologne, where, together with Flanders, the plates were chiefly made. Many brasses in England were of continental origin, but most were of native workmanship. The brass being a substitute for a stone effigy, the figures were represented as if lying on the back, the head resting on a cushion or helmet, and the feet on a lion or dog, as in the stone monuments; but in the XVIth century the practice arose of showing figures kneeling and in other awkward positions—an attempt at realism, but an evidence of decay in art which was not found at the best period. Enamel was used in some brasses, but this, not being a durable material, or perhaps the method of its application not being sufficiently understood, had in most cases worn off. There was an example of the use of enamel locally in some brasses in Hathersage Church. These monuments, he said, might be divided into four classes—military, ecclesiastical, civil, and miscellaneous. It was impossible to overrate the importance and value of monumental brasses, forming, as they did, a series of illustrations of and a commentary on the history, dress, manners, and customs of our ancestors. In them they could trace the change from mail to plate armour, and its gradual disuse as a means of defence, the changes in civilian

costume showing the rise of a new order, but perhaps the clerical ones were especially noteworthy, as it was the rule of the church to bury ecclesiastics in full dress with all the ornaments of their orders, which were hence faithfully represented on the brass.—On the motion of Mr. J. Hale, seconded by Mr. C. F. Innocent, and supported by Messrs. J. R. Wigfull, H. L. Paterson, W. C. Fenton, and T. S. Brown, a hearty vote of thanks was accorded to the lecturer. The lecture was illustrated by rubbings taken by Dr. Stokes.

LIVERPOOL ARCHITECTURAL SOCIETY.—On the 7th inst., in the Society's rooms, Harrington-street (Mr. P. C. Thicknesse presiding), Mr. Robert P. Oglesby gave a lecture before the Liverpool Architectural Society on "Sir John Vanbrugh, Dramatist and Architect." Mr. Oglesby said that as a playwright Vanbrugh was subject to considerable raillery by Swift, Pope, and other contemporaries, but still more so when, apparently without any education in that direction, he began to practice as an architect, and under the afflatus of Court favour quickly attained to great success, even ousting Sir Christopher Wren from connection with the great Blenheim Memorial undertaking. By the aid of limelight views Mr. Oglesby was enabled to point out the main features of Vanbrugh's architectural style, distinguishing what approved itself to him as commendable in contrast with the many eccentricities and extravagances of Vanbrugh, who subordinated utility to scenic effect.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The opening meeting of the new session of Edinburgh Architectural Association was held on the 9th inst., in the Association's rooms, 117, George-street, Mr. Harold Tarbolton, F.R.I.B.A., President of the Association, in the chair. In his opening address, which was on the subject of "Education and Architecture," Mr. Tarbolton said the two schools in Edinburgh which included the teaching of architectural subjects—the Heriot-Watt and the School of Art (better known as the School of Applied Art)—both fell very far short of meeting the real requirements of a school of architecture. The scope of the work was not sufficiently extensive. The standard and results of the Applied Art School were excellent so far as they went, and, being under the direct control of architects, the school supplied in a limited way the needs of those who used it as a supplement to their office work. In the teaching schools in London, Birmingham, Liverpool, Manchester, and Glasgow, the requirements for the examination of the Royal Institute of British Architects were kept in view, and a systematic course of instruction in architectural history and detail and general professional practice provided. In Edinburgh no attempt was made to prepare students for this examination. A chair or lectureship of technical science was urgently required, which would pave the way to organised teaching schools. The University authorities said that funds were not available for the endowment of a chair. In America patriotic citizens had met the occasion, and surely there were those in this country who would in a like manner come forward in the interests of an object that so much touched the welfare of the country. The course of instruction would need to embrace the special subjects demanded from architectural students for the passing of the R.I.B.A. examination, as well as such subjects of general education as were required for degrees in science, including modern languages, and the course would be useless unless it extended for at least three academic years.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The twenty-ninth report of the Leeds and Yorkshire Architectural Society, for the period from November 1903 to May 1904, shows that up to the latter date the total membership was 155; namely, thirty-five honorary members, sixty-seven members, and fifty-three associates, as against a membership of 152 at the date of the last report, showing a slight increase. A silver badge of office, to be worn by the President of the Society, has been purchased. The badge has been executed by the Bromsgrove Guild of Applied Arts, and has been subscribed for by members of council and of the Society. The Society's library has now been deposited with the reference department of the Leeds City Library authorities, where the books will be more strictly supervised. Any member or associate can borrow books on the production of his certificate of membership.

NORTHERN ARCHITECTURAL ASSOCIATION.—The council (with the approval of Mr. Glover) have decided to purchase No. 6, Higham-place, Newcastle-on-Tyne, as permanent premises for the Association. In addition to the 500*l.* of Consols, already given by their past President, Mr. Glover, about 700*l.* or 800*l.* will be required to complete the purchase and make the necessary repairs and alterations. Those who wish to subscribe are requested to send their donations to the hon. treasurer, Mr. R. Burns Dick, 24, Grainger-street West, Newcastle. A list of the amounts received will be acknowledged in a circular. It is hoped (subject to the consent of the council) to further arrange with Mr. Stanley A. Smith, P.A.S.I., for a course of six lectures to members of the Students' Sketching Club, on "Quantities."

ENGINEERING SOCIETIES.

THE SOCIETY OF ENGINEERS.—A *conversazione* in connexion with the jubilee celebration of the Society of Engineers was held on Wednesday at the Royal United Service Institution, Whitehall, which was used for the first time for such a purpose. Founded in 1854, the Society was first known as the "Putney Club," owing to the fact that it had its inception among the students of Putney College, an institution then existing for the education of engineers. Meetings were held periodically at the offices of Mr. R. M. Christie and Mr. H. P. Stephenson, who, with Mr. Alfred Williams, were chiefly instrumental in bringing the new body into being. In 1857 the Society received the title it has since borne, and twelve months later the authors of papers were for the first time encouraged by the award of premiums for their most noteworthy contributions. To provide for the augmented membership that followed, the lower chamber of Exeter Hall was engaged for the meetings, and the usefulness of the organisation was further recognised in 1863, when the members began to pay visits to works possessing special interest to engineers. The Society has steadily advanced in strength, and on the occasion of the present jubilee numbers nearly 600 members. Mr. Perry F. Nursey, the present secretary, and an ex-president, was first associated with it in 1858, and, in a retrospect of the work done, he has mentioned the fact that forty-four volumes of its transactions have been published, embodying 371 papers and filling over 10,000 pages. The guests of the Society on Wednesday who assembled at the invitation of Mr. D. B. Butler, the President, and the members of the Council included Alexander Siemens, Dr. Kennedy, Dr. Francis Elgar, Sir Leader Williams, Sir A. Noble, Sir J. Thorneycroft, and the Presidents of the Surveyors' Institution, Institution of Mining and Metallurgy, Junior Institution of Engineers, Royal Institute of British Architects, the Civil and Mechanical Engineers, and the Chairman of the Society of Arts. The museum of the Institution was thrown open to visitors.

Correspondence.

ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

SIR,—In the report of the last meeting of the Architectural Association Discussion Section in the current number of the *Builder* (page 495), many of the remarks attributed to me are quite different from, and in one case contrary to, what I actually said, and I shall be much obliged if you will kindly insert a correction in this week's number. I said I thought that 9-in. thick external walls would not keep out the wet, cold, and heat unless covered with cement, rough-cast, or weather tiles, or something of that nature. Also that I had found straw thatch required renewing in a few years, but that reed thatch lasted a great deal longer. My experience was that there was practically no difference *in cost* between casement windows and double-hung sashes.

LOUIS AMBLER.

[*** We are not responsible for the errors Mr. Ambler complains of; the reports of the Discussion Section meetings (unless in exceptional cases) are kindly furnished to us by members of the Section, and are not by our own reporter.—ED.]

BOOKS RECEIVED.

HISPANO-MORESQUE WARE OF THE XVTH CENTURY. By A. Van de Put. (Chapman & Hall. 12*s.* 6*d.*)

THE CATHEDRAL CHURCH OF ST. ASAPH. By Pearce B. Ironside Bax. (Geo. Bell & Sons.)

COMPETITIONS.

LIBRARY, BENWELL.—In a competition for designs for a public library for the Benwell District Council, that by Mr. Vernon Hodge, 11, Grand-parade, Teddington, has been placed first, and the premium of 75*l.* awarded,

ISLINGTON PUBLIC LIBRARIES.—The special committee appointed by Islington Borough Council to carry out the arrangements in regard to the proposed new public libraries reported on Wednesday that they had approached the President of the Royal Institute of British Architects (Mr. J. Belcher) with a view to obtaining his services. He had agreed to act as assessor and adviser to the committee with respect to the designs for the central and four branch libraries.

OBITUARY.

MR. NORTON.—We regret to announce the death, on November 10, at Bournemouth, in his eighty-second year, of Mr. John Norton, formerly of No. 13, Bedford Row, London. Mr. Norton was elected an Associate (as a life-member) of the Royal Institute of British Architects in 1850, and a Fellow in 1857; he served for a while as a member of the council. Amongst Mr. Norton's more important architectural works we may cite Christ Church, Great North-road, Finchley, built for 670 sittings, and illustrated in the *Builder* of February 19, 1870; the restoration, thirteen years ago, of the parish church, Newport, Shropshire; the church of St. Helena, Lundy Island, in 1895-6; Stoke Bishop Church, near Bristol, in 1864, to which he added the tower and spire in 1872, the Infants' Home at Limpsfield for the Church Missionary Society; St. Matthew's Church, Brighton; Christ Church and Emmanuel Church, Clifton; other churches at Bedminster, Builth, Ebbw Vale, Newport (Salop), etc.; Training College and Schools for the Diocese of Gloucester and Bristol; Royal Normal College for the Blind, Norwood; Elvedon Hall, Suffolk, for the Maharajah Duleep Singh; "Tyntesfield," Somerset; Ferney Hall; public works and buildings for the new Boulevard, Florence; winter garden, Tynemouth; the Turf Club, Piccadilly; South-Western Terminus Hotel, Southampton; Horstead Hall, Norfolk; Framlingham Hall, Norfolk; Brant Knoll, Somerset; several county courts and residential flats and hotels, etc. He leaves, besides his widow, eight daughters and two sons, the youngest of whom, Mr. C. Harrold Norton, is carrying on the practice. Mr. Norton was President of the Architectural Association for the Session of 1858-9; and at the funeral, which took place at Bournemouth on Monday, the Association were represented by their Secretary, Mr. Driver.

MR. SAMES.—We have also to announce the death of Mr. W. H. F. Sames, aged forty years. Mr. Sames practised as an architect in partnership with his brother, Mr. G. G. Sames, under the style of "Sames & Green," at No. 65, Northgate, Blackburn, and No. 2, Knott-street, Darwen, Lancashire. Messrs. Sames & Green made the plans and designs for the new buildings, and for the extensions of the then existing buildings, of the Royal Cross School at Preston, together with the school sanatorium; the Sunday schools at Lower Darwen, for the United Methodist Free Church; the Conservative clubhouse, at Guide, Lancashire; and the Central Stores, on the Green, at Darwen. Four years ago they were one of the six architects who were invited to take part in the competition for the erection of the Blackburn Police Courts, with fire-station, firemen's cottages, etc. We commented upon their submitted designs in an article upon the competition in our number of December 22, 1900.

MR. BOYCE.—We regret to have to record the death of Mr. Thomas Boyce, of No. 8, Hart-street, Bloomsbury, the well-known contractor, who died on Friday, the 4th inst., after a very short illness, at the comparatively early age of fifty-seven. Mr. Boyce had carried on a very large business for over thirty years, having started at the age of twenty-five years, and had ben entrusted with numerous important works. Among the works he carried out were the following:—Alterations at Sandringham, for the King (then Prince of Wales); mansion in Bagshot Park, for the Duke of Connaught; "Saint Bruno," Sunningdale, for Count Gleichen; Oakleigh Court, for Lord Fitzgerald; mansion, Newmarket, for Marquis of Huntingdon; Constitutional Club, Northumberland-avenue; Maxim Nordenfelt Works, Erith. Numerous blocks of flats—Artillery-mansions, Victoria-street; St. Mary's-mansions, Paddington; Brook-street-mansions,

Hanover-square, W.; No. 9, Cavendish-square. Various hotels—Badminton Club, Piccadilly; Naval and Military Club Chambers, Piccadilly; Burlington Club; The Metal Exchange, E.C.; numerous churches, schools, private houses, etc. Mr. Boyce, in addition to being a contractor, was also one of the largest flat owners in London, and was chairman and director of several property companies.

MR. STANFORD.—Mr. Edward Stanford, Geographer to the Queen, died at his residence in Sidmouth a few days ago, in the seventy-eighth year of his age. Mr. Stanford, who succeeded the late James Wyld, of West Strand and Charing Cross, as Geographer to the Queen, founded the well-known business-house of "Edward Stanford"—sellers and publishers of maps and geographical and topographical works, and sole agents in London for the publications of the Ordnance Survey; he retired from business some years ago. The firm removed from No. 55, Charing Cross upon the completion of their present premises, Nos. 26-7, Cockspur-street, in 1889, erected for them upon the site of the British Coffee House, after designs by Mr. Thomas Barnes-Williams, which were illustrated in the *Builder* of January 12, 1889. Those premises having been purchased by the London County Council for purposes of their staff in 1901, the firm erected additional premises at Nos. 12, 13 and 14, Long-acre, as their chief establishment and for the housing of their complete stock of the Ordnance maps, transferred their general (not geographical) bookselling and stationery departments to Messrs. Hugh Rees, Ltd., of No. 124, Pall Mall, and, having altered the front shop in Cockspur-street, re-opened it as a place of retail business for the sale of their own publications as well as of maps and geographical books.

GENERAL BUILDING NEWS.

RESTORATION SCHEME, BERWICK PARISH CHURCH.—A commencement has been made with the scheme for the enlargement and restoration of the parish church. The architects are Messrs. Hicks & Charlewood, diocesan architects, Newcastle, and the main features of the improvements are:—(1) The entire removal of the existing north and south galleries; (2) the construction of an organ chamber on the north side of the chancel, and the removal thereto of the organ; (3) re-arrangement and extension of the west gallery, consequent upon the removal of the organ, with a new staircase and additional door; (4) provision of a new system of heating and ventilation. The total number of sittings in the remodelled church is to be 854. The work has now begun on the construction of the new organ chamber. The contract for the improvements is in the hands of Messrs. Gray & Sons, masons, Berwick.

CHURCH, LINCOLN.—A new church was consecrated at Lincoln on the 5th inst. by the Bishop of Lincoln. The new Church of All Saints' consists of a nave, with north and south aisles, chancel, with transepted organ chamber on its south side, and a transept on its north, with a choir vestry opening out of it eastwards, and sacristy outside the east end of the chancel. A stained-glass window has been placed in the east end by Messrs. Clayton & Bell. At the west end, under the three windows, is a font, carved in red stone, and standing on two steps. A large organ is being built for the church by Messrs. H. Willis & Son. Externally the church is of red brick, with Bath stone dressings, while the inner faces of the walls are plastered. The roofs are covered with red tiles. The contractors for the church were Messrs. Otter & Sons, of Lincoln; Messrs. Bowman & Sons, of Stamford, for the oak work; Mr. Milburn, of York, for the font and carving; Mr. C. Gregory, of Lincoln, for the electric lighting; Messrs. Richardson & Co., of Darlington, for the heating; Messrs. Laidlors, of Durham, for the brass standards; and Messrs. Patterson & Co., of Durham, for altar frontals, hangings, and other textile fittings. Mr. A. Gordon was clerk of the works, and the architect was Mr. C. Hodgson Fowler, F.S.A., architect, of Durham.

CONGREGATIONAL CHURCH, NEWLAND, HULL.—The foundation-stones were laid a short time ago of a new Congregational church, which is to be built at Newland. The building is intended to provide 803 sittings, 634 in the body of the church and 169 in the gallery. The usual vestries, with a church parlour, and a school, will be provided. The cost, inclusive of all charges, is estimated at 7,000*l*. Mr. J. H. Fenwick is the contractor for the work, the architects being Messrs. Moulds & Porritt, of Manchester.

MEMORIAL CHAPEL, TOTLAND, ISLE OF WIGHT.—The Island Bible Christians are erecting a new memorial chapel at Totland Bay. Mr. S. E. Tomkins, of Newport, is the architect, and Messrs. J. Ball & Son, of Cowes, are the builders. The chapel will be built of Swanage stone and Bath stone dressing, and have a length of 55 ft. and width of 36 ft. The height to the walls will be 22 ft. 9 in., and to the apex of the roof 46 ft. The pitch-pine pews are to seat 260 worshippers. The rostrum, behind which is to be the choir gallery, will be constructed of pitch-pine. The minister's vestry and the stewards' vestry will be situated on each side of the rostrum, while at the entrance to the building there will be a vestibule with granite columns.

SYNAGOGUE, NEW CROSS-ROAD, LONDON.—The new South-Eastern Synagogue in the New Cross-road will provide accommodation for 200 men and 150 women. The building cost 5,000*l*. Mr. Delissa Joseph and Mr. C. P. Roberts were the architect and builder respectively.

SCHOOL, LOUGHBOROUGH.—Upon the site of the Cobden-street Board Schools, Loughborough, which were partially destroyed by fire about a year ago, has been erected a new school. At the new school accommodation is provided by a two-storied building on the Cobden-street frontage, the girls being allocated to the ground floor, and the boys to the first floor. The accommodation provided in the new building is for 300 girls and 300 boys, while the classroom formerly belonging to the girls' school has been restored and added to the infants' department. The building consists of five classrooms on each floor, each classroom arranged on either side of a corridor, 10 ft. wide, and extending from end to end of the building. The two classrooms in each department are divided by removing partitions, so as to be thrown open into one. Separate sitting-rooms for teachers are provided. The floors and staircases of the building are of fireproof construction, but in order to avoid any risk of fire an iron staircase is provided on the outside of the building, approached from the main corridor by a door fitted with panic bolts. An additional exit has been made for girls upon the ground floor. The floors of the classrooms and corridors are covered with maple boards, and the walls are plastered and lined to a height of 4 ft. with glazed tiles. All the woodwork is in pitch-pine. The staircase floors, cloak-rooms, etc., are of concrete stone. Messrs. Corah & Sons are the contractors, and Messrs. Barrowcliffe & Allcock the architects.

SCHOOL, WEST HARTLEPOOL.—On the 2nd inst., at West Hartlepool, the foundation-stone was laid of a new school situated in Elwick-road. The new building, which will be utilised for the purposes of higher grade education, will be a three-story erection with two-story wings. Accommodation will be provided for 1,200 scholars, divided equally into senior and junior boys' and girls' departments. The third story will provide accommodation for science teaching, and will include a lecture-room, with gallery, and demonstration table, and preparation-room. Over the boys' play-shed a room will be provided as a workshop, equipped for instruction in manual work. The building will be lighted by electricity. The school has been designed by Mr. Richard Holt, of Liverpool, and the contractors for its erection are Messrs. T. Beetham & Son, West Hartlepool. The total estimated cost of the new school is 21,041*l*.

COUNCIL SCHOOLS, BROOMHILL, NORTHUMBERLAND—The new schools at Broomhill, which have been erected by the Northumberland County Council, were recently opened. Mr. J. W. Douglas, architect, designed the buildings, and the contractors were Messrs. R Carse & Son.

PAROCHIAL BUILDINGS, ST. SILAS'S, BYKER.—The foundation-stone of St. Silas's new parochial buildings at Byker was laid on the 2nd inst. The new buildings are situated at the corner of Rodger-street and Heaton Park-road South. They will contain two large halls, on the first and second floors, with class-rooms, etc. The total cost will be 2,500*l*. Mr. A. B. Plummer, Newcastle, is the architect, and Mr. J. L. Miller, North Shields, the contractor.

ST. JAMES THE LESS, BETHNAL GREEN.—The medical mission-house was opened recently, having been erected at a cost of 1,200*l*., after plans and designs by Mr. E. Hoole. The building, situated within the grounds of the church, includes two consulting-rooms, two dressing-rooms, a waiting-hall, surgery, etc., and the mission will be served in connexion with the Ridley Hall, now in course of being built.

WESLEYAN MISSION CENTRAL HALL, SHEFFIELD.—At a meeting of the Wesleyan Mission Committee, which was held on the 4th inst. at the Norfolk-street premises, Sheffield, the amended designs for the new central hall, on the site of the Norfolk-street chapel, which had been prepared by Messrs. Waddington, Son, & Dunkerley, were submitted by the Plans Committee. On the proposition of Mr. S. Meggitt Johnson, seconded by Mr. Albert Heath, it was agreed that the plans, as amended, be now accepted by the committee.

FREE LIBRARY, SANDOWN, ISLE OF WIGHT.—The free library, which is to be erected at Sandown, will have a frontage to High-street of about 57 ft., with a little more than that to Victoria-road. A tower, 42 ft. high, is over the main entrance, which will be at the corner. The building will be of white bricks, with slated roof. On the High-street side will be the reading-room, 31 ft. 6 in. by 18 ft., and 14 ft. in height, with a side recess. On the Victoria-road front will be the lending library, and reference library behind. A corridor, 6 ft. 6 in. in width, extends the entire length of the Victoria-road part. Upstairs there is a committee-room, 31 ft. 5 in. by 19 ft. This, it is hoped, may in time develop into a museum. The ladies' room measures 19 ft. by 12 ft. On this floor also will be found the domestic offices for the curator. In the tower provision has been made for the accommodation of a sunshine recorder. Mr. E. James, of Binstead, is the builder, and Mr. J. Newman is the architect.

PROPOSED WESLEYAN COLLEGE, BRISTOL.—A new Wesleyan college is to be erected on a site in Hampton-road, Bristol. On the ground floor, besides the entrance hall, will be the inner or staircase hall, common-room for students, library, and dining and assembly hall, which will be carried up the height of two floors and surrounded by a gallery. At the rear of the hall will be the buttery, kitchens, pantries, and rooms for the housekeeper. A committee-room will also be provided, and the necessary cloakroom and lavatory accommodation. The staircase leading to the first floor is in oak, and on this floor are two large lecture-rooms and one smaller one, the gallery of the hall being also reached from this level. Adjoining the college and communicating with it will be the residence of the principal, which will face and be approached from Cotham-road. Bath stone in random courses will be used for facings, with Gloucestershire stone slates for the roof, the stone mullioned windows being glazed with lead lattice panes. The interior will have floors of wood block, some of the rooms being finished with oak panelling. The buildings, in addition to open fireplaces in the principal rooms, will be heated on the low-pressure hot-water system. Mr. H. Dare Bryan, architect, has prepared the plans for the work.

FREE LIBRARY, SALISBURY.—The Mayor of Salisbury (Mr. C. J. Woodrow) laid the foundation-stone recently of the new free library building. The entrance will be at the left hand, or western side, of the front by means of a vestibule, 11 ft. wide, opening on the hall and staircase, which, together, will be 19 ft. wide. The staircase leading to the reference library will be of artificial stone, with iron balustrade. The lending library will be 29 ft. by 30 ft., and will be separated from the hall by a glass screen and the librarian's counter. At the back end of the hall access will be obtained to the reading-room, which will be 61 ft. by 32 ft., and is to be lighted by means of two large lantern lights in the ceiling. Between the lending library and reading-room will be placed the librarian's office, provided with glass sides, so as to command nearly the whole of the ground floor of the premises. On the first floor the reference library will be 40 ft. by 26 ft., and a ladies' room, 17 ft. by 13 ft. 6 in. The premises are to be heated with hot-water radiators, which will be placed in front of the fresh-air inlets. The total cost of the building will be 4,000*l*. It has been designed by Mr. Alfred C. Bothams, and the contractors are Messrs. Harris Bros.

NEW BUILDINGS, LIVERPOOL UNIVERSITY.—Two new buildings for the University of Liverpool have just been opened—new medical buildings and the George Holt Physics Laboratory. The new medical buildings form an addition to, and in some respects a completion of, the equipment of the medical school of the university. It is now some years since the entire block of which they are a part was designed by Messrs. Alfred Waterhouse & Son, of London, and the present buildings have been carried out by Mr. Paul Waterhouse. A polygonal apse at the western angle is the outline of the two theatres—surgical and anatomical—the sloping seats of which are arranged over one another so as to avoid the possibility of loss of space. The basement room below these theatres is a polygonal laboratory. The building contains a professors' common-room, private rooms for the Dean of the Medical Faculty and the Professor of Anatomy, and certain storerooms and workshops,

but with these exceptions the whole of the contents are taken up with laboratories and classrooms, large or small. On the top floor there is, among other rooms, an operative surgery theatre. Special classrooms for materia medica, etc., are placed on the mezzanine between the ground floor and the first, in which the working benches are covered with enamelled iron tops. The external walls are faced, like the other buildings of the university, in ordinary local bricks, with dressings of red Ruabon bricks. The George Holt Physics Laboratory is built in juxtaposition with the new Johnston Bacteriological Laboratory, communicating with it on the first floor by means of a bridge. The materials of the external walls correspond with those of that laboratory, being of common brick with broad courses of red brick and dressings of Storeton stone. The tower is provided for experimental purposes, and is open all the way down, with an electric lift to give access to any portion of it. It is also used for a water-tank. The ground floor of the building comprises an entrance hall, arranged under the high part of the seating of the lecture theatre. From the one side of the entrance hall approach is given to the professor's private room and research laboratory; from the other there is access to the junior laboratory and a classroom. Behind the theatre are placed the preparation-room and apparatus-room. On the first floor are a library, senior students' laboratory, standard-room, sound and light rooms, and dark-room. The second floor is devoted mainly to research for honorary students. A spectroscopic-room is also here, and there is access to an observatory. In the basement are an additional research-room for the professor, a furnace-room, workshop, liquid-air room, and a room for the use of X-rays. There are also a constant temperature-room and stores. The building stands on solid rock, and precautions have been taken to prevent vibration. Messrs. Willink & Thicknesse, of Liverpool, and Professor F. M. Simpson, are the joint architects.

INSTITUTE PREMISES, READING.—Lord Rosebery recently visited Redhill to open the new Colman Institute. The building includes a lecture hall, to be known as "King's Hall," capable of seating over 300 persons. The work has been carried out from designs by Mr. Hubert Gilford, at a cost of about 5,500*l*.

NEW WARDS, THE LONDON HOSPITAL.—The consecration and opening of four new Hebrew wards at the London Hospital took place on the 14th inst. The new wards are situated on the top floor of the west wing of the hospital, and provide accommodation for twenty-seven men and twenty-seven women. Each ward measures 72 ft. long, 21 ft. wide, and 12 ft. high, and has a sister's room, scullery, bath-room, etc., attached to it. The floors are finished with cement, while the walls throughout are lined with light green opalite. As the wards are constructed side by side—two of them running parallel to the other two—special attention has been given to the ventilation, which is obtained by raised lanterns in the roof along the back of the wards. A large kitchen—to be used exclusively for these wards—and scullery, which are constructed in the centre of the floor, with two wards each side of them, are paved with mosaic, the walls being tiled. A wide balcony is fixed round the south end of the building. The architects are Messrs. Rowland Plumbe & Harvey.

BOYS' BRIGADE HALL, WARLEY.—The 1st Warley Company have just erected new head-quarters at Warley. The hall is 55 ft. long and 25 ft. wide, having small non-commissioned officers' room at the rear; the exterior elevations are of rough cast and local red brick, the brickwork inside is left perfectly plain, the woodwork throughout stained green. The heating is by beaten iron fireplaces on the "well fire" principle, and supplied by Messrs. Bratt, Colbran, & Co., the lighting being by Lucas' lamps; the floor is of pitch pine, laid by Messrs. Ellis, Geary, & Co., of London. This building was opened on the 10th inst. by Bishop Taylor Smith, with a silver key designed and presented by the architect, Mr. Hugo R. Bird. Mr. F. W. Burtwell, of Brentwood, was the contractor.

WESLEYAN CHURCH, WAVERTREE, LIVERPOOL.—A new Wesleyan church was opened on the 4th inst. in Elm Hall-drive, Penny-lane, Wavertree. The scheme comprises the erection of a church to seat about 800 people. Adjoining this site a school-chapel has been built at a cost of between 4,000*l*. and 5,000*l*., this being the building which has just been opened. The structure is of red Ruabon dressed brick, with Portland stone facings. The large hall will seat about 500 people, and there are vestries, cloakroom, classroom, a ladies' parlour, and other accommodation. On the upper floor is a smaller hall, which will seat about 300 people. The construction of the building has been superintended by Messrs. Gilbert Fraser and Arnold Thornely.

POLICE STATION, STRADBROKE, SUFFOLK.—The erection of the new police station at Stradbroke has now been completed. The work has been carried out by Messrs. E. Rumsey & R. Butcher, builders, under the supervision of Mr. Henry Miller, the County Surveyor.

STAINED GLASS AND DECORATION.

WINDOW, ST. GEORGE'S CHURCH, BRISTOL.—A large stained-glass east window has just been placed in the Church of St. George, Bristol, containing five lights and tracery. The centre light depicts the Crucifixion, the other four illustrating the Baptism of Our Lord, St. John, the Virgin, and The Supper at Emmans. All the subjects are crowned by canopy work, angels with outspread wings appearing in the tracery, and at the bottom of the two outside lights. The work has been executed in the studio of Messrs. Percy Bacon & Brothers, of London.

SANITARY AND ENGINEERING NEWS

WATERWORKS, MAESTEG.—The new reservoir, which is being constructed by the Maesteg Council, is situated at the head of a valley on the mountain side at a spot known as Blaencwmceryn. The gathering area comprises about 200 acres, situated at the top of the mountain. An earthwork impounding dam is being constructed across the valley to form a reservoir, with a storage capacity of 30,000,000 gallons of water. A puddle trench wall will be constructed through the middle of the dam, from the bottom of the puddle trench to within a few feet of the top of the embankment. An outlet tunnel is being constructed through the side of the hill, clear of the dam, through which the supply pipes will be carried, and also the sludge or wash-out pipe. A cast-iron water-tower will be erected from the bottom of the reservoir, rising above the highest water level, in which sluice valves will be fixed to draw off the water at different levels for supplying the town. The inner slope of the dam will be pitched with stones on edge, and the exit tunnel will be lined with brickwork all through. The actual water area will be 4½ acres. The scheme is the work of Mr. J. Humphreys, C.E., the Maesteg District Surveyor, who drew up the plans. The contract price is 29,000*l*., and the contractors are Messrs. W. Jones & Sons, Neath.

WIDENING OF UNION BRIDGE, ABERDEEN.—Plans have been prepared by Mr. William Dyack, the Burgh Surveyor, for the widening of this bridge. The structure at present has a width of 40 ft., but when the proposed alterations have been carried out this will have been increased to 60 ft.

FOREIGN.

GERMANY.—The new exhibition buildings at Berlin designed by Herr Paul Jautschu will be finished on May 1, 1905, and are to open with an exhibition of the German Society of Artists.——The well-known inn "Zum Ritter," at Heidelberg, a Renaissance building of the year 1592, is to be restored under the direction of Herr Otto Linde.——The Museum of Armoury, at Munich, designed by Herr Mellinger, and built at a cost of 2,750,000 francs, is nearly completed.——The Diocesan Museum in connexion with the cathedral at Treves was opened on October 3.——An exhibition took place in October at the ancient "Red Houuse," in Treves, of a collection of household furniture and utensils used by ancient inhabitants of the Saar, Eifel, and Mosel districts; the collection was left to the town by Professor Kraus, a native of Treves.

AUSTRIA.—A "Peoples' Palace" is being built at Vienna, from the plans by Herr von Neumann; the building is to contain a large hall for dramatic representations, a concert hall to accommodate 200 persons, some small lecture-rooms, a reading-room with a library attached, a canteen, a club-room, and living accommodation for the officials.——The new chapel connected with the asylum of district XIII. in Vienna is to be designed by Professor Otto Wagner.——The Austro-Hungarian Bank at Buda Pest is completed; the building was designed by Herr Ignaz Alpàr in Renaissance style, and was erected at a cost of four million francs.——The restoration of the cathedral at Salzburg, which was undertaken by Herr Josef Eigl in May, 1899, will be completed in the spring.——Herr Germano Wanderley, Professor of Architecture at the German State School, died at Brün on October 31 in his sixtieth year.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Professor Henry Adams, M.Inst.C.E., has recently retired from the City of London College, where for thirty-five years he has been head of the engineering department; he is, however, continuing his practice as a consulting engineer at 60, Queen Victoria-street, E.C.

IMPROVEMENTS, MANGOTSFIELD, GLOUCESTERSHIRE.—At the parochial offices, Staple Hill, on the 28th ult., Col. Langton Cole, M.Inst.C.E., conducted an inquiry concerning an application from the Warmley Rural District Council for sanction to borrow 800*l*. for private street works in the parish of Mangotsfield and 400*l*. for the purposes of public lighting in the parish. Details as to the proposed works were given by the Surveyor, Mr. H. Bennett.

ANCIENT CROSSES AND HOLY WELLS OF LANCASHIRE.—The seventh of a series of papers on "The Ancient Crosses and Holy Wells of Lancashire," which have been prepared by Mr. Henry Taylor, F.S.A., the President of the Lancashire and Cheshire Antiquarian Society, was read at a meeting of members of the Society, held on the 11th inst. at the Cheetham Library. The paper was read by Mr. Isaac Taylor. It dealt with the Hundred of Salford. The inland position of this part of Lancashire, which consisted in the Middle Ages of wild, uncultivated moors, did not, Mr. Taylor said, tempt the monks to settle here, and consequently there were only two institutions of this character in the Hundred of Salford—Kersal Cell and the Manchester Collegiate Church. Among the ancient crosses in the hundred were those in the market-places of Manchester and Salford, both destroyed in the first quarter of the XIXth century, and both probably many times rebuilt in the course of time. There were, besides a pre-Norman cross and other early sculptures at Bolton-le-Moors, a portion of a pre-Norman cross found on the banks of the Irwell near Eccles, and market crosses at Bolton-le-Moors, Rochdale, Eccles, Stretford, Ashton-under-Lyne, and probably in some other towns. In all Mr. Taylor had collected information about thirty ancient crosses in this hundred. The derivation of the word Salford had, he said, by some been supposed to mean the ford over which salt was brought from the Cheshire mines, but his researches had led him to form a different conclusion. He considered that the word is derived from the Anglo-Saxon *Scalh*—a sallow—for in numerous instances throughout England the name Salford occurs (as at Tonbridge, in Kent) far away from salt mines and invariably in low-lying situations near the marshy banks of rivers where willows flourish. The Salford in the ancient town of Tonbridge was unquestionably the old ford by the sallows, or willows, which still grow so abundantly on the banks of the Medway. In Lancashire instances occur in similar positions near Blackburn, Burnley, and Clitheroe. Again, leading down from the Eccles market-place, where were anciently two market crosses, Salter's-lane took one to the ancient ford over the Irwell at the very spot where the shaft of a pre-Norman cross was found in making the Manchester Ship Canal. The shaft is now preserved in the Manchester Museum. "Saltreford" means the ford by the sallow tree. Manchester had its holy well, to which cripples were carried on horseback or barrows, and it might be hoped that some of the sufferers were actually cured, whether miraculously or not. The site was near the New Bailey-street bridge. A curious illustration of the tenacity of ancient customs was to be found in John Byrom's "Memoirs," for he there recorded how in times of commotion—as on the arrival of the Pretender in Manchester—the people met for counsel and mutual protection at the Manchester market cross, and it was here—at the market crosses of Manchester, Salford, and Bolton—that John Wesley preached to tumultuous assemblages in the middle of the eighteenth century. —*Manchester Guardian.*

MILTON MEMORIAL, CRIPPLEGATE.—A bronze statue of Milton, standing at the entrance of St. Giles', Cripplegate, was recently unveiled by Lady Alice Egerton. Bas-reliefs in bronze adorn two sides of the base, which is of stone, that on the east representing the expulsion of Adam and Eve from the Garden of Eden by the Archangel Michael; while that on the west is of a scene from Comus. Mr. Horace Montford was the sculptor, and Mr. F. S. Hammond the architect, of the monument.

WAR MEMORIAL, BURY ST. EDMUND'S.—The memorial which has been erected at Bury St. Edmund's to the officers and men of the Suffolk Regiment who lost their lives in the South African war, was unveiled on the 11th

inst by Lord Methuen, G.C.B. The monument stands upon the Cornhill, and it has been designed and executed by Mr. Arthur George Walker, sculptor, of London.

ST. ERTH'S CHURCH, NEWTON, CORNWALL.—New altar rails have been placed in this church. They are of XVth century Gothic design, and have been executed in oak by Messrs. Harry Hems & Sons, of Exeter.

THE SLATE TRADE.—A meeting of the Festiniog Quarry proprietors was held on the 10th inst., and it was decided to continue the present prices and terms for 1905. The Carnarvonshire Quarry owners have not yet issued their lists for next year, but it is believed that uniform prices will be arranged for all the quarries working on the Bangor vein. This will have the effect of steadying trade, which has been rather disorganised the last few months.

Legal.

BUILDING OWNER AND ARCHITECT: QUESTION OF THE OWNERSHIP OF DRAWINGS.

THE case of Gibbon *v.* Pease came before Mr. Justice Ridley, sitting without a jury in the King's Bench Division, on the 15th inst., an action by Mr. Henry Gibbon, of Kent House, Ealing, against the defendant, Mr. Charles Edward Pease, of No. 16, Clifford's-inn, E.C., for delivery up of certain plans, specifications, papers, and writings which the plaintiff alleged the defendant had wrongfully detained. There was also a claim for damages.

Mr. Danckwerts, K.C., and Mr. H. Gatehouse appeared for the plaintiff, and Mr. H. T. Kemp, K.C., Mr. P. B. Morle, and Mr. Simmonds for the defendant.

Mr. Gatehouse, in the absence of Mr. Danckwerts, opened the plaintiff's case. He said the action was brought to recover from the defendant, who was an architect, the possession of some plans, specifications, papers, etc. The defendant, in his statement of defence, set up that there was a custom in his profession which entitled him to detain the plans and other papers. The defendant also said that, in October, 1903, differences arose between him and the plaintiff with regard to the work and the claim of the defendant to the plans and other papers, and that, in November, 1903, the plaintiff paid, and defendant accepted, a sum of money in satisfaction of all differences, and that the plaintiff's claim in this action was thereby satisfied and discharged.

Mr. Kemp said that his learned friend need not trouble himself with the second point in the defence.

His lordship: Then the only question is whether the plans, etc., belong to the architect?

Mr. Kemp: Yes.

Mr. Gatehouse, continuing, said that the facts were these:—In September, 1902, Mr. Henry Gibbon, the owner of certain property in the Queen's-road, Bayswater, was desirous of converting several of a row of houses, which were shops, into flats, and the plaintiff was introduced by a firm of house agents to Mr. Pease, and Mr. Pease was employed by the plaintiff as the architect for the purpose of carrying out the conversion of the shops into flats. A contract was entered into with a firm of contractors in October, 1902, and the work was proceeded with, and Mr. Pease did the usual work of an architect in preparing plans, specifications, and bills of quantities.

At this stage Mr. Danckwerts came into court, and, by leave of his lordship, continued the opening of the case. He said that the question to be decided was a comparatively short one from some points of view. The real question was whether an employer who employed an architect for reward to make plans for him, and to supervise the building operations, was entitled to have the plans paid for by the employer.

His lordship said he thought that matter had been settled in the case of Ebdy *v.* McGowan.

Mr. Danckwerts said he thought that the decision in that case settled the point.

Mr. Kemp remarked that his contention would be that the facts in that case were quite different from the facts in this case.

Mr. Danckwerts, continuing, said that the plaintiff employed the defendant to do the work in question on the usual terms, that defendant should receive for his services 5 per cent. on the contract price. For the purpose of preparing the plans the plaintiff lent the defendant the original plans of the buildings, and according to which they had been built. The contract with the builders was dated October 24, 1902. His lordship would see that the plans which were then in course of being prepared by the defendant were made part of the contract. It was also a condition of the contract that the work should be carried out under the direction and to the satisfaction of the architect. Amongst other things water fittings had to be put in the premises. These fittings were put in, but the water company, not being satisfied with them, some question arose between the plaintiff and the defendant in that respect. The plaintiff, having employed a plumber in the neighbourhood to satisfy the water company, there arose a dispute as to what sum the defendant was entitled to. Eventually the defendant was paid his charges. In the meantime Mr. Gibbon had been asking Mr. Pease for the plans he had prepared for him, and the other documents belonging to him in the possession of the defendant. Mr. Pease refused, however, to deliver them up, and set up a claim to them. He (counsel) thought it was old law that when you employed somebody to do something for which that somebody was paid, it was an implied term of the contract that the result should belong to the employer. Mr. Pease apparently said no. He set up the defence of custom. The custom to be good must be universal, well known, and generally acted on. The Institute that looked after the interests of architects had, he thought, always accepted the ruling in Ebdy *v.* McGowan.

His lordship: I do not think I need trouble you further, Mr. Danckwerts. I say there is no custom. The architect is not entitled to plans I have paid him for.

Mr. Kemp said that the plans in question were probably not of value, but there was no doubt that this was a *bonâ fide* and honest dispute between two persons as to who was entitled to certain documents. The statement of claim was, of course, in *detenue*, and the plaintiff could not succeed unless he could prove that the various documents were his property. That was how the claim was based. If his lordship looked at the particulars, he would see what the plaintiff claimed.

Mr. Danckwerts said that the plaintiff would be satisfied if the defendant returned the signed plans he had prepared, the plans he had subsequently prepared for the purpose of carrying out the work, and the specifications.

Mr. Kemp said he should be able to show that the defendant was employed by the plaintiff, not only as architect on the ordinary terms, but also as a quantity surveyor. As a rule the quantity surveyor was a person other than the architect. In many cases it was not desirable to employ the architect as a quantity surveyor. Different principles applied to the documents he prepared as quantity surveyor than to those he prepared as architect.

Mr. Danckwerts said he thought he could clear the ground on this point. What he wanted were the builder's priced lithographic bills and their day work sheets.

Mr. Kemp submitted that what the contract was, was this. The plaintiff being desirous of converting the shops into flats got into communication through another gentleman with the defendant. This gentleman saw the defendant and asked him to prepare certain drawings for the alteration of the buildings. That was done, and they were shown to the plaintiff. The plaintiff made certain alterations, and the result was that Mr. Pease was asked to reconsider the matter, and he prepared some more plans to be shown to the plaintiff some few days before the contract was ever entered into at all. These plans were shown to the plaintiff before there was any contract of employment. On September 9, 1902, Mr. Pease was appointed for the purpose of doing what? He was to have the ordinary fee of 5 per cent. on the contract price, and for that he was to do this:—He was to see that certain buildings were altered in accordance with certain plans approved of by the plaintiff, and after that was done, he submitted, with some confidence, that the plaintiff had got all he bargained for, and paid for. If he proved that, the plaintiff would have no claim in the action, and the plans would not belong to him at all. The next thing that happened was that, some few days afterwards, the defendant was employed as quantity surveyor at the ordinary charge. That came out of the pocket of the contractor. On this head all the plaintiff now claimed were the priced lithographed bills and the day work sheets. The priced lithographic bills were sent to the quantity surveyor entirely for his own use, and with these the building owner had nothing whatever to do.

His lordship said he should follow the ruling in the case of Ebdy *v.* McGowan unless Mr. Kemp could show him that there was an express contract between the parties that the plans, etc., should belong to the defendant. If he did not do that he should hold that they belonged to the plaintiff.

Mr. Kemp said he hoped to establish a custom in the profession that the plans under such circumstances belonged to the architect. It could not be reasonably suggested that such a contract was an unreasonable one. The plans were prepared simply for the purpose of enabling the architect to see that the buildings were constructed in accordance with the aproved design. If architects were bound to hand over these papers immediately at the conclusion of the work, they would be left in an absolutely hopeless position, and if they were attacked at any time they would be unable to protect themselves.

His lordship: Unless there is any contract to the contrary I say that the plans belong to the building owner.

Mr. Kemp: Well, I shall tender evidence of custom that, in the circumstances of this case, the plans and specifications and details are the property of the architect.

His lordship: I do not think I ought to receive it. I do not think there is any distinction between this case and Ebdy *v.* McGowan. I think that this is an attempt to break the law. You must make your terms if you want to keep the plans.

Mr. Kemp: Will your lordship grant me a stay of execution.

His lordship: What about the quantity surveyor documents?

Mr. Simmonds (after consulting with his client): We do not claim them. We will abandon our claim to everything but the plans and specifications.

Mr. Kemp said that those papers were quite enough on which to raise the question of principle. He asked for a stay of execution for three weeks, and if the defendant entered an appeal within that time, a stay until the hearing.

His lordship: Yes.

In answer to his lordship, Mr. Kemp stated that the defendant would undertake to hand over to the plaintiff the documents in question if the Court of Appeal affirmed his lordship's judgment.

His lordship said that on that understanding he would only give the plaintiff the nominal damages of 1s.

Judgment accordingly.

THE WIDENING OF QUEEN-STREET, HAMMERSMITH.

THE case of Parry *v.* the Metropolitan Borough of Hammersmith came before Mr. Justice Warrington, in the Chancery Division, on the 15th inst., on a motion by the Vicar and Churchwardens of St. Paul's Church, Hammersmith, for an interim injunction to restrain the defendants from enforcing the compulsory powers given them by Michael Angelo Taylor's Act, under which the defendants proposed to acquire a portion of St. Paul's Churchyard for the purpose of widening Queen-street, Hammersmith. The application was based on the ground that the defendants were not *bonâ-fide* exercising their statutory powers for their own purposes, but for the purpose of assisting the London County Council compulsorily to acquire the land for the purpose of their Queen-street improvement.

It appeared that the London County Council, by an Act passed in 1902, acquired power to construct an electric tramway along, amongst other streets, Queen-street. The defendants opposed the Bill when it was before Parliament on the ground that Queen-street was too narrow for the purpose. Subsequently the defendants withdrew their opposition on the London County Council agreeing to widen the road if they could get the necessary consents. The defendants agreed to assist in obtaining the necessary consents, and to bear one-third of the expenses of widening the street. To do this work of widening the street it was necessary for the London County Council to acquire a portion of the churchyard. As the County Council could not come to terms with the plaintiffs as to purchase of the land, and the County Council had no power to acquire the land compulsorily, they requested the defendants, in July, 1904, to put into force the powers they had under Michael Angelo Taylor's Act for the compulsory acquisition of the land required. On July 27 the Borough Council held a meeting at which a report from their Law and Parliamentary Committee was presented, the Committee recommending that the Borough Council should grant the County Council its aid by putting in force its statutory powers

under Michael Angelo Taylor's Act. The Borough Council passed a formal resolution agreeing to do this, and appointed the solicitor and valuer of the County Council to be the solicitor and agent of the Borough Council for the purpose of acquiring the land in question. The defendants served notice to treat on the plaintiffs, and ultimately the present action was commenced. The plaintiffs' case was that the adjudication of July 27 was void, as being *ultra vires*, and was a device for getting their property for the County Council, which deprived them of the right they had of appearing before the Parliamentary Committee and opposing the County Council Tramway Bill when they might have got the tramway route altered, or have obtained ample compensation for their land.

In the result his lordship refused the motion, holding that the plaintiffs had not shown any want of *bona-fides* on the part of the Borough Council, who, in his opinion, were exercising the statutory power on their own behalf with a view of facilitating improvements which they thought desirable.

Mr. Spence appeared for the plaintiffs, and Mr. Norton, K.C., and Mr. Methold for the defendants.

ACTION BETWEEN PROPERTY OWNERS IN BERKELEY-SQUARE.

THE case of Hall *v.* Lewis came before Mr. Justice Buckley in the Chancery Division on the 10th inst.

Mr. Astbury, K.C., and Mr. Ashton Cross appeared for the plaintiff, and Mr. Buckmaster, K.C., and Mr. Holmes for the defendant.

Mr. Astbury, in opening the case, said the action was brought by Mrs. Hall for the purpose of recovering damages for an injury she had sustained to her house, No. 2, Berkeley-square, by reason of damp percolating through from the adjoining premises, No. 3, Berkeley-square. The plaintiff was lessee for a term of fifty-five years of her premises. Defendant recently purchased and was now the lessee of the adjoining premises. His case was that defendant allowed water to accumulate in the basement of his premises and failed to keep it in, and it percolated through the lower part of the plaintiff's house. It had cost 89*l.* to put the matter right. Defendant had done some work, and the matter complained of had, it appeared, been stopped. An injunction had been asked for, but there was was no necessity for that now, and they simply asked for damages. The damp had soaked the party wall and spread through to the plaintiff's floors.

Mr. Buckmaster: The Tyburn runs at the rear of these houses.

Mr. Astbury: I thought it was a mews there.

Mr. Buckmaster: The Tyburn is covered in now. I have seen leases on this property giving the right of fishing in the Tyburn.

In the result his lordship, after hearing evidence, said he had no doubt that at some period the soil of the houses was a water-bearing strata. But it was not proved that the defendant allowed water to accumulate in his basement. The owner of No. 3 had made his basement watertight. In his lordship's opinion it was not proved that the damp came from No. 3, and that was the only question he had to consider. To his mind the party wall sucked up the damp from the water-bearing strata, and that was how the mischief was caused. The plaintiff had not proved her case, the onus being upon her. The action would be dismissed, with costs.

LIABILITY ON PLASTERER'S CLAIM UNDER WORKMEN'S COMPENSATION ACT.

THE case of Evans *v.* Cook—Lancashire and Yorkshire Insurance Company, Ltd., third parties, came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Stirling and Mathew, on the 10th inst., on two appeals from the judgment of Mr. Justice Wills at the Nottingham Assizes.

The action was brought by a contractor against the defendant, a sub-contractor, to recover 84*l.* 5s. 3d. paid to a workman named Fraime who was in the employment of defendant, and who had been injured by an accident which arose out of and in the course of his employment. The plaintiff also claimed any other sums which he might pay to the workman down to the date of the judgment and a declaration that defendant was liable to indemnify him in respect of future payments.

It appeared that in July, 1901, plaintiff, under a contract, was constructing a workhouse infirmary at Nottingham, the defendant entering into a sub-contract with the plaintiff to execute the plastering work necessary for the building. On July 9, Fraime, while at work on the plastering, met with an accident, notice of which was given both to the plaintiff and the defendant under the provisions of the Workmen's Compensation Act, 1897. The plaintiff immediately agreed to pay Fraime 15s. 9d. per week, being half his average weekly earnings, during incapacity. A year afterwards, the House of Lords having in the meantime decided the case of Cooper and Crane *v.* Wright, the plaintiff demanded repayment of the sums paid to the workman Fraime, and brought the present action against the defendant in the High Court. The defendant, then being insured against liability under the Workmen's Compensation Act, 1897, with the Lancashire and Yorkshire Insurance Company, brought that Company in as third parties, claiming an indemnity from them. The Company contended that the plaintiff had no right to sue the defendant in the High Court, but was bound to take proceedings for arbitration under the Act of 1897, and that therefore, as the defendant was not liable in the action, the Company were not liable. Mr. Justice Wills, however, held that the action was maintainable, and gave judgment for the plaintiff for the 84*l.* 5s. 3d., and for a further sum, calculated at 15s. 9d. per week from the date of the writ up to the date of the judgment. His lordship also made a declaration that the defendant was liable to pay to the plaintiff such sums as the plaintiff might be liable to pay to Fraime under the Act in respect of the accident. He also entered judgment for the defendant against the third parties for payment of the amounts in question to the defendant. Hence the present appeals of the Insurance Company and the defendant (the latter served notice of appeal at the request of the Insurance Company, so that the whole case might be before the court).

Mr. Hugo Young, K.C., and Mr. J. D. Crawford appeared for the Insurance Company, Mr. W. Wills and Mr. T. T. Blyth for the defendant Cook, and Mr. Stanger, K.C., and Mr. McCardie for the respondent on the appeal (the plaintiff).

Mr. Hugo Young contended, on behalf of the Insurance Company, that the action was not maintainable in the High Court, the whole scheme of the Act of 1897 being that all claims thereunder should be decided by arbitration.

In the result their lordships, without calling upon counsel for the respondent, held that such an action as the present was maintainable, and dismissed the appeals, with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

25,374 of 1904.—H. C. MICHELL and D. S. MICHELL: *Manufacture or Production of Material Suitable for Use as a Non-conducting Covering for Steam Pipes, Boilers, and other bodies.*

A non-conducting material composed of or containing flake mica, consisting of a binding material such as clay that is normally dry, and is capable of forming a plastic binding agent when mixed with water, and fibrous material, for example, asbestos fibre, the mica and fibrous material being more or less uniformly mixed together, and the binding agent being more or less uniformly distributed amongst and firmly attached to the flake mica or flake mica and fibrous material so that it will not become readily detached therefrom during transport, and so that upon addition of water to the mixture the latter can be readily formed into a plastic mass.

27,483 of 1903.—R. A. BREARE: *Hoists.*

This invention relates to a hand-operated hoist, applicable mainly for the transport of light articles, at comparatively high speeds, between the various floors of shops, warehouses, and other buildings. In constructing this hoisting apparatus a suitable counter-balanced cage is employed suspended by means of a rope fastened over a grooved pulley, which is keyed on to the main shaft of the apparatus. This shaft carries a two-compartment drum which is arranged on the free-wheel principle, that is to say, the drum is adapted to rotate freely upon the shaft, independent of the motion of the shaft itself. Upon one compartment of the drum is wound the hand rope for actuating the hoist, whilst the other compartment carries a counter-weighted rope wound in the opposite direction. The aforesaid shaft carries also a pair of ratchet wheels keyed thereon, one on each side of the drum, one of these ratchet wheels engaging with a travelling pawl carried by the drum, and the other engaging with a stationary pawl having an independent support. A trip bar is provided by which the two pawls may be released from their respective ratchet wheels, the rope which actuates the said trip bar being connected also to a suitable band brake.

27,727 of 1903.—J. S. GABRIEL: *Treads for Stairs, Floors, and the like.*

According to this invention a tread for stairs, floors, and the like consists of a metal base plate having grooves in it to receive bars of lead, or the like, the bases of which are formed to fit the grooves in the plate. The spaces between the bars are filled with cement or other similar substance which, with the bars, forms the top of the tread. Preferably the grooves are of dovetail section, and the bars of rail section, and made in short lengths. Preferably also the base plates are provided with vertical longitudinal flanges on one or both edges of their upper faces. By this means a durable tread is provided that can easily be constructed and easily broken up when it is desired to repair it.

27,853 of 1903.—W. WILLIAMS and F. H. COLLINS: *Means for Securing Door and like Handles to their Spindles.*

This consists in securing door and like handles to their spindles by means of a baffle plate or the like made in two portions, and adapted when in position and fixed to the door to engage a groove or flange in or on the neck of the handle.

27,908 of 1903.—J. H. J. B. PETTER: *A Combination Household Dust Bin or Refuse Bin or Receptacle and Sifter.*

A combination household dust bin or the like closed receptacle and sifter, comprising a receptacle with means to close same, a cylindrical volute or nautilus or similar-shaped reticulated cage, sieve, or sifter arranged and adapted to be revolved or reciprocated around a shaft or axis horizontally disposed or thereabouts in said receptacle, and means to revolve or reciprocate said cage, sieve, or sifter from the exterior of the receptacle.

28,128 of 1903.—J. H. DOUGLAS: *Construction of Hinged Window Sashes.*

This relates to windows, and consists in the use of hinges which permits of the lower sash being raised, and, when thus raised, providing means for pivotting or supporting such sash so that it may be bent inwardly.

28,141 of 1903.—FRASER & CHALMERS, LTD., and F. L. WHITMORE: *An Adjusting Link for Hoisting Cages, and the like.*

An adjusting link for hoisting cages, and the like, comprising three plates, one of same having transverse grooves or slots on both sides, corresponding projections or ridges on the inner surface of the other plates, bolt holes or slots in all the plates for enabling them to be bolted together, and a hole or holes in each for connecting to a part or attachment.

14,593 of 1904.—A. BOWMAN: *Casement Fasteners.*

This invention relates to casement fasteners, and commonly known as "cockspur" fasteners, in their various kinds. The main object of this invention is to provide a fastener, of the above-named type, which can be very readily adapted for use either upon a right or left-handed casement. To adapt the fastener for use on a right and left handed casement, it is constructed in the following manner:—The short arm or tongue of the fastener which engages with the hook or mortice plate on the casement frame, is separate from the handle part, and the latter will preferably be bent outwards, to allow for hand room in use. The upper part of the handle is connected to the aforesaid short arm or tongue, at right-angles or approximately so to same, by passing it through a vertical eye in the short arm, the upper part of the handle projecting above the top of the eye.

18,142 of 1904.—C. W. HUNT: *Hoisting Apparatus.*

A hoisting apparatus, consisting in the combination of two drums loosely mounted, an equalising gear in operative relation with both drums, means to apply power to the equalising gear, a brake for said equalising gear, and an independent motor operable independently of the said means to apply power to one of said drums.

18,143 of 1904.—C. W. HUNT: *Hoisting Apparatus.*

A hoisting apparatus, consisting in the combination of an equalising gear, two drums mounted on axes independent of the equalising gear, loosely mounted baffle gears in

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

engagement with said equalising gear, transmitting gearing between the baffle gears and said drums respectively, and means to apply power to the equalising gear.

18,278 of 1904.—B. E. BECHTEL: *Method of and Apparatus for Drying Bricks and other articles.*

A dryer, consisting in the combination, a hot-air flue having a top opening, means to support a row of brick stacks along said opening, and a fabric hood or covering along said row of brick stacks, said covering formed in sections, each section comprising a top framework, the fabric extending over the framework and having depending curtains.

19,802 of 1904.—E. R. PALMER: *Automatic Flushing Siphons.*

An automatic flushing siphon wherein by giving the connecting bend of the discharge limb and seal a rising gradient or curve from approximately where it leaves the vertical portion of the seal, the foot of the air column when on the horizontal plane which it reaches just before escaping through the seal, is caused to extend beneath practically the whole length of such bend to close to the commencement of the vertical rise of the seal, and is increased in area.

20,172 of 1904.—M. D. HELFRICH: *Water-closet Bowls.*

This consists in constructing a closet bowl with a trap seal whose passage or outlet is of uniform area throughout, a main supply passage leading to the trap seal on the opposite side thereof from its outlet or discharge, said main supply passage being of uniform area in cross section to the water line of the trap seal, and gradually diminishing in area from said water line to its communication with said seal, and having a hollow rim and a passage inclining upwardly from the main supply passage to and opening into the said hollow rim.

22,726 of 1903.—C. E. LIVESAY: *Means or Apparatus for Admitting Water from Rivers and other Waterways into Hydraulic Works.*

A dock connected to a river through an entrance lock, the means for admitting water to the dock as the river rises consisting of paddle wheels, or other suitable positively-operated devices that draw water from the river and deliver it into the dock to prevent flow through the entrance lock, whereby the channels conveying the water can be fitted with appliances to prevent or impede the ingress of the greater portion of silt.

26,655 of 1903.—C. H. ROBOTTOM: *Apparatus for Making Artificial Stone Blocks.*

A hinged or pivoted platform vibrated by revolving cam wheels, and supported by eccentric means, whereby the amount of vibration may be regulated.

27,128 of 1903.—J. TAYLOR: *Ventilating Buildings, Vessels, and other Confined Places.*

A method of and apparatus for ventilating buildings, vessels, and other confined places, consisting principally in combining with a main horizontal feed pipe connected with a revolving fan, or the like, of horizontal arms extending therefrom, and having pendant pipes at their extremities, the lower ends of such pipes being closed by means of a cap or disc of larger diameter than the said pipes, and the latter being perforated with small holes above such caps or discs.

27,479 of 1903.—A. BROWN and H. G. CLARKE: *Apparatus for Drying, Heating, Coating, and Mixing Granite, Slag, Stone, or other Materials with Tar, or the like.*

According to this invention the body of the apparatus may be constituted of a fixed cylindrical chamber set in an inclined position, on the underside of the lower end of which is a furnace-box. Above this chamber is a tank made preferably in the form of a saddle to fit on or form part of the wall of the chamber. The tank which is for holding and heating the tar or the like material, is preferably situated above the fire-box, and is made of any required capacity; it may also be divided by a partition into two compartments.

28,716 of 1903.—H. L. DOULTON and W. DENNISON: *Making Moulds for Casting Baths, Cisterns, and similar articles.*

This invention relates to moulds for casting baths, cisterns, and similar articles. Hitherto, in moulding a bath, a loose pattern has been employed, the procedure being to place the pattern on a flat ramming-up board, the pattern being inverted. A box is then placed over the pattern, sand placed therein, and rammed upon the pattern, the box part and pattern being then turned over, and any box part placed on the top, the sand being filled into the hollow of the pattern and forming the core for the bath. When the core is formed the two box parts are turned over again, one of the box parts being lifted away from the other, the pattern withdrawn, and the box placed together again ready for casting.

488 of 1904.—L. W. CROSTA: *A Joint for Sanitary Tubes, Conduits, and the like.*

This consists in the combination with an ordinary earthenware or similar pipe socket of a joint ring, the inside of which is so formed as to provide two bearings for the spigot end of the inserted pipe to rest upon for forming a true invert.

3,361 of 1904.—T. MACHARACECK: *Scaffolding.*

A scaffolding frame, for use in working on house fronts, with sockets let into the wall of the building for fixing the frame supports, the distinguishing feature being that rods are employed as frame supports, the free ends of which are connected together either directly or with the aid of couplings through the medium of rods adjustable by means of tension fastening devices, the rods being thus crosswise strutted one with the other, and suspended against the wall of the house.

19,055 of 1904.—O. MESS: *Floor, Wall, Ceiling, and other Coverings.*

A floor or wall covering, consisting of a foundation of suitable material, a superposed layer of an oil containing cement composition, and a surface layer of wooden blocks united to the intermediate layer and to each other by a suitable wood cement.

19,671 of 1904.—W. L. CALDWELL: *Paving Lights, and the like.*

A paving light glass of arch form, constructed with a tread portion, locking tongues or shoulders spaced from the tread portion, a supporting base portion, and a plurality of prism portions projecting beneath the tread portion, the reflecting faces of the prism portions extending at different angles with relation to the tread surface.

20,018 of 1904.—T. W. RIDLEY, J. TAIT, and J. D. WILLIAMSON: *Slag or Scoriæ Bricks or Blocks, and the Method of and Apparatus for Manufacturing the same.*

A mould for casting slag bricks, consisting of two parts hinged together, one of the parts being slotted to receive the hinge pin so that lateral as well as radial movement of the part and pin relatively to each other is possible.

20,245 of 1904.—A. JACQUES and H. JACQUES: *Waterproof Inlaid Floors.*

Waterproof inlaid floors, characterised by individually-formed panels or slabs, each one consisting of several plank sections arranged lengthwise side by side provided on their underside with dovetailed grooves, and connected by means of transverse planks having dovetailed projections fitted into said grooves, the underside of each slab being coated with a thin layer of waterproof material, upon which is poured subsequently a strong layer of concrete, or the like.

20,250 of 1904.—J. W. HAYWARD: *Glass Facings or Face Plates for Bricks, and the like.*

A glass facing plate for bricks, provided with a rib of uniform thickness lengthwise on its back near each edge, and said ribs inclined laterally and terminating back from the end of the facing, thus leaving a narrow-ribbed portion at each end of the brick.

20,257 of 1904.—V. LION: *Parquetry.*

A member or element for parquetry, characterised by the connexion of the plates by means of screws upon dovetail cross-pieces, and by flat iron bars arranged diagonally relatively to the plates, upon the cross-pieces connecting them.

20,261 of 1904.—W. C. HARDER and C. W. ANDREWS: *A Metal Sheet Piling.*

This invention has for its object to provide beam piling sections in which the interlocking features necessary in holding the sections loosely together when assembled in a wall structure, is made an integral part of the piling sections which are duplicates of each other, and dispense with the use of a separate locking means mechanically secured to the beams.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

November 3.—By MADDISON, MILES, & MADDISON (at Bungay).

Ditchingham, Norfolk.—A freehold holding, 3 a. 3 r. 32 p., f.	£300
A freehold house, y.r. 9*l.*	200
Blacksmith's and wheelwright's shop and premises, y.r. 15*l.* 10s.	280
A freehold cottage, y.r. 15*l.*	250
Two enclosures of land, 5 a. 2 r. 13 p., *f.*	150

November 7.—By FRITH, GARLAND, & Co.

Finsbury Park.—135, Lothair-rd., u.t. 73 yrs., g.r. 6*l.* 6s., e.r. 34*l.*	£300
Harringay.—68, Cavendish-rd., u.t. 72 yrs., g.r. 5*l.* 10s., e.r. 36*l.*	300

By LESLIE, MARSH, & Co.

South Kensington.—2a, Providence-ter., u.t. 53½ yrs., g.r. 7*l.*, y.r. 55*l.*	600

By NORMAN & SON (at Stratford).

Forest Gate.—69, 71, and 73, Tower Hamlets-rd., f., w.r. 62*l.* 8s.	445
35 and 37, Stracey-rd., u.t. 61½ yrs., g.r. 8*l.* 8s., w.r. 46*l.* 16s.	220
Stratford.—38, Victoria-st. (s.), u.t. 62 yrs., g.r. 3*l.* 10s., w.r. 32*l.* 10s.	185
Tottenham.—58 to 70 (even), Templeton-rd., u.t. 71½ yrs., g.r. 24*l.* 10s., w.r. 154*l.* 14s.	800

November 8.—By ALLAN BOOTH.

Holloway.—4, Beacon-hill, u.t. 37½ yrs., g.r. 8*l.* 8s., p.	390
21, Beacon-hill, u.t. 37½ yrs., g.r. 8*l.* 8s., e.r. 55*l.*	435
32, 36, and 38, Hungerford-rd., u.t. 42½ yrs., g.r. 9*l.*, y.r. 146*l.*	1,295
63, Hartham-rd., u.t. 42½ yrs., g.r. 7*l.*, y.r. 50*l.*	440
8, Dalmeny-av., u.t. 15 yrs., g.r. 4*l.* 12s. 6d., e.r. 60*l.*	340
13, Hilldrop-cres., u.t. 44 yrs., g.r. 8*l.*, y.r. 55*l.*	480

By A. G. BONSOR.

Teddington, Middlesex.—1 to 12, Victoria-ter., f., w.r. 235*l.* 6s.	2,460
Hampton Wick, Middlesex.—School-rd., "The Assembly Rooms," also "The Cottage," u.t. 82 yrs., g.r. 7*l.* 10s., p.	625
Park-rd., "Mayfield," u.t. 82 yrs., g.r. 9*l.*, e.r. 35*l.*	250
Kingston Hill, Surrey.—Upper-pk.-rd., "Torrington," f., e.r. 80*l.*	1,350

By S. B. CLARK & SON.

Cavendish-square.—55 and 56, Welbeck-st., u.t. 70½ yrs., g.r. 68*l.*, y.r. 600*l.*	9,600

By MILLAR, SON, & Co.

Bayswater.—4, Chepstow-pl., u.t. 39 yrs., g.r. nil, p.	670

By ROGERS, CHAPMAN, & THOMAS.

Chelsea.—Hasker-st., f.g. rents 10*l.*, reversion in 39 yrs.	340
Hasker-st., f.g.r. 4*l.* 5s., reversion in 46 yrs.	380
Ovington-st., peppercorn g.r., reversion in 40 yrs.	350

By STOCKER & ROBERTS.

Bermondsey.—5 to 9, Anthony-st., u.t. 37 yrs., g.r. 27*l.*, w.r. 100*l.* 2s.	340
Rotherhithe.—14 to 20, Barkworth-rd., u.t. 72 yrs., g.r. 20*l.*, e.r. 135*l.* 4s.	980
Lambeth.—43 and 44, Lower Marsh (s.), u.t. 6 yrs., g.r. 40*l.*, y.r. 73*l.* 6s. 8d.	130

By WALTON & LEE.

Sandy, Beds.—"Sandye-pl.," and 35 acres, f., p.	8,800
Rugby, Warwick.—"Westfield House Estate," 166 a. 0 r. 20 p., f.	15,000

By DEBENHAM, TEWSON, & Co.

Spitalfields.—55, 57, and 59, Hanbury-st. (warehouses), area 5,280 ft., u.t. 79½ yrs., g.r. 31*l.*, y.r. 350*l.*	4,000
61, Hanbury-st., and 28 and 30, Pelham-st. (warehouses), area 4,200 ft., u.t. 64½ yrs., g.r. 55*l.*, p.	3,050
Balham.—21, Old Park-av., u.t. 84 yrs., g.r. 10*l.* 10s., p.	555
Camden Town.—High-st., etc., f.g. rents 400*l.*, reversion in 7 yrs.	15,860
Wellington-st., "The Cricketers" p.h., f.g.r. 105*l.*, reversion in 81 yrs.	3,000
Shaftesbury-avenue.—Nos. 87 and 89 (s.), f., y.r. 125*l.*	4,160
Finsbury Park.—Blackstock-rd., f.g.r. 18*l.* 2s., reversion in 53 yrs.	495
Battersea.—Ashton Buildings, f.g. rents 60*l.*, reversion in 81½ yrs.	1,360
Rainham, Essex.—Rose Cottages, f.g.r. 10*l.*, reversion in 44½ yrs.	300
Main road, freehold marshland with buildings thereon, 13 a. 2 r. 13 p., y.r. 39*l.*	780
Limehouse.—Nightingale-la., f.g.r. 15*l.*, reversion in 57½ yrs.	340
Stoke Newington.—Matthias-rd., f.g.r. 25*l.*, reversion in 71½ yrs.	580
17, 19, and 21, Wellington-rd., also a plot of land, u.t. 6 yrs., g.r., &c., 32*l.*, y.r. 135*l.* 18s.	115
Shepherd's Bush.—2, 4, 8, to 18 (even), Coningham-rd., u.t. 57½ yrs., g.r. 56*l.*, w.r. 327*l.* 12s.	2,220
106, Gayford-rd., u.t. 76½ yrs., g.r. 6*l.* 10s., y.r. 29*l.*	255
87, Cobbold-rd., u.t. 76½ yrs., g.r. 5*l.* 5s., w.r. 33*l.* 16s.	230
Highgate.—2, Norman-villas, u.t. 41½ yrs., g.r. 3*l.*, w.r. 31*l.* 4s.	300
Fulham.—31, 33, 37, to 51 (odd), Strode-rd., u.t. 71 yrs., g.r. 58*l.*, w.r. 304*l.* 4s.	1,820
Walthamstow.—21 to 27 (odd), Storey-rd., u.t. 82 yrs., g.r. 16*l.*, w.r. 93*l.* 12s.	545

November 10.—By J. G. DEAN & Co.

Tooting.—130 to 136 (even), Himley-rd., f., w.r. 135*l.* 4s.	960

By DUNCAN & KIMPTON.

Finsbury.—69 & 71, Clifton-st. (warehouse, stabling, &c.), u.t. 16 yrs., g.r. 12*l.* 16s., e.r. 120*l.*	795

By MONTAGU HOLMES & SONS.

Greenwich.—44 and 46, Bridge-st., u.t. 55½ yrs., g.r. 5*l.*, w.r. 57*l.* 4s.	390
Bow.—6 and 7, Cantrell-rd., u.t. 59½ yrs., g.r. 7*l.*, w.r. 70*l.* 4s.	410
47, Lichfield-rd., u.t. 39 yrs., g.r. 3*l.* 10s., y.r. 30*l.*	250
Victoria Park.—91, Approach-rd., u.t. 49 yrs., g.r. 7*l.*, q.r. 40*l.*	340
306, Wick-rd., u.t. 49 yrs., g.r. 3*l.* 10s., w.r. 27*l.* 6s.	200
Bow.—8 and 9, Cantrell-rd., u.t. 60½ yrs., g.r. 7*l.*, w.r. 70*l.* 4s.	460

By H. J. BLISS & SONS.

Shepherd's Bush.—Boscombe-rd., l.g.r. 12*l.*, u.t. 59½ yrs., g.r. nil	£240
Deptford.—Angers-st., l.g.r. 10*l.* 10s., u.t. 62½ yrs., g.r. 1*l.*	150
Balham.—Byrne-rd., l.g.r. 75*l.*, u.t. 70 yrs., g.r. 1s.	1,300
Leytonstone.—103 and 131, Cann Hall-rd., f., w.r. 63*l.* 14s.	645

By T. B. WESTACOTT.

Hampstead-rd.—69, Stanhope-st., u.t. 16½ yrs., g.r. 28*l.* 7s., w.r. 100*l.* 2s.	150
Camden Town.—40, St. Augustine's-rd., u.t. 46 yrs., g.r. 6*l.*, e.r. 56*l.*	525

By STIMSON & SONS.

Southwark.—99 and 101, Redcross-st. (warehouses), f., y.r. 390*l.*	6,000
Redcross-st., f.g.r. 7*l.* 1s., reversion in 7 yrs.	900
91 and 93, Redcross-st. (s.), f., w.r. 72*l.* 16s.	880
Redcross-st., the "Prince of Wales" b.-h. and house and shop adjoining, f., y.r. 66*l.* 8s.	3,250
1 and 2, Disney-st. (lodging house), f., p., with goodwill	950
12, Marshalsea-rd. (lodging house), f., p., with goodwill	2,700
Camberwell.—76 and 78, Camberwell-rd., f., y.r., and e.r. 110*l.*	1,680
112, 120, and 122, Camberwell-rd. (s.), f., y.r. 192*l.* 10s.	3,010
122A, Camberwell-rd. (factory), f., y.r. 50*l.*	700
124, Camberwell-rd. (lodging house), f., p., with goodwill	7,100
126, 130, and 132, Camberwell-rd. (s.), f., y.r. 150*l.*	2,550
38, 40, 42, 46, 48, 56, and 58, Camberwell-gr., f., y.r. 276*l.*	4,210
89A, 91, and 93, Camberwell-gr., with stabling, f., y.r. 195*l.*	2,200
95, 97, 99, and 101, Camberwell-gr., f., y.r. 228*l.*	2,750

November 11.—By BOWDITCH & GRANT.

Addiscombe. — Canning-rd., "Worcester Lodge," f., p.	1,200

By P. J. DIXON & SON.

Bethnal Green. — 33, Sidney-st., f., w.r. 28*l.* 12s.	305
212 and 216, Green-st. (s.), y.r. 79*l.* 10s.	985
262, 262a, and 266, Cambridge-rd. (builder's yard, workshops, etc.), u.t. 18 yrs., g.r. 70*l.*, y.r. 162*l.* 12s.	375
264 and 268, Cambridge-rd., u.t. 18 yrs., g.r. 46*l.*, y.r. 80*l.* 16s.	105
7 to 13 (odd), Wadeson-st., u.t. 18 yrs., g.r. 22*l.*, w.r. 72*l.* 16s.	145
9 and 11, Bishop's-rd., u.t. 63 yrs., g.r. 24*l.*, y.r. 64*l.*	605
74 and 76, Hare-st. (s.), u.t. 8 yrs., g.r. 5*l.*, y.r. 91*l.*	140
Hackney.—28 and 28a, North-st., f., w.r. 72*l.* 16s.	730
Hornsey Rise.—45, Hanley-rd., f., y.r. 50*l.*	725
Whitechapel.—17 and 19, Brady-st. (s.), and 1, Winthrop-st., u.t. 265 yrs., g.r. nil, y.r. 70*l.*	1,350

By DOLMAN & PEARCE.

Chalk Farm.—31, Oppidans-rd., u.t. 60 yrs., g.r. 10*l.*, e.r. 70*l.*	410

By EDWARD WOOD.

Kentish Town.—64, Castle-rd. (s.), u.t. 56 yrs., g.r. 6*l.* 10s., y.r. 45*l.*	340
Streatham.—28, Eastwood-st., u.t. 97 yrs., g.r. 5*l.* 10s., w.r. 29*l.* 18s.	200
Battersea.—5, Knox-rd., f., w.r. 31*l.* 4s.	280

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold: c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental: w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, NOVEMBER 18.

Junior Institution of Engineers (Westminster Palace Hotel).—Mr. William H. Lindley, of Frankfort-on-Maine, will deliver his Presidential Address, on "Municipal Engineering on the Continent." 8 p.m.

Institution of Mechanical Engineers. — Ordinary General Meeting. Mr. A. E. Seaton and Mr. A. Jude on "Impact Tests on the Wrought Steels of Commerce." 8 p.m.

MONDAY, NOVEMBER 21.

Royal Institute of British Architects.—(1) M. L. G. Mouchel on "Monolithic Constructions in Hennebique Ferro-concrete." (2) Mr. W. Dunn on "Construction and Strength of Reinforced Concrete." 8 p.m.

London Institution. — Mrs. E. Burton-Brown on "Recent Excavations in the Roman Forum"—Illustrated. 5 p.m.

Liverpool Architectural Society.—Mr. Arnold Mitchell on "The Study of Mediæval Work." 6 p.m.

Junior Institution of Engineers.—Visit to Dudley Port and Birmingham to inspect the Central Station of the South Staffordshire Mond Gas Co., and the Nechells Gas Works of the Birmingham Corporation. Train leaves Euston at 9.20 a.m.

TUESDAY, NOVEMBER 22.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Mr. W. J. Dibdin, F.I.C., on "Sewage Disposal," I. 7 p.m.

Institution of Civil Engineers.—Mr. J. F. Cleverton Snell on "Distribution of Electrical Energy." 8 p.m.

Northern Architectural Association.—Address by the President, Mr. J. Walton Taylor. 7.30 p.m.

THURSDAY, NOVEMBER 24.

Builders' Benevolent Institution. — Fifty-seventh Annual Dinner (Whitehall Rooms, Hôtel Métropole, W.C.). 6.30 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, NOVEMBER 25.

Architectural Association. — Messrs. J. T. Micklethwaite & E. Prioleau Warren on "Excavations in Westminster." 7.30 p.m.

SATURDAY, NOVEMBER 26.

The Sanitary Institute (Sessional Meeting to be held at the Guildhall, Nottingham).—Discussion, to be opened by Dr. P. Boobbyer, on "Present-day Aspect of Conservancy Systems." 11 a.m.

TO CORRESPONDENTS.

B. C. (MS. and diagrams received).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 14 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 13 0	" " "
Facing Stocks	2 12 0	" " "
Shippers	2 10 0	" " "
Flettons	1 8 0	" at railway depôt.
Red Wire Cuts	1 14 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	4 4 0	" " "
Do. Bullnose	4 10 0	" " "
Best Stourbridge Fire Bricks	4 8 0	" " "

GLAZED BRICKS.

Best White and Ivory Glazed Stretchers	13 0 0	" " "
Headers	12 0 0	" " "
Quoins, Bullnose, and Flats	17 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	less than best.

	s. d.	
Thames and Pit Sand	7 0	per yard, delivered.
Thames Ballast	6 0	" "
Best Portland Cement	29 0	per ton, "
Best Ground Blue Lias Lime	20 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "

PORTLAND STONE (20 ft. average)—

Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	" "

STONE (*continued*).

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Greenshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 5	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

YORK STONE—*Robin Hood Quality.*

Scappled random blocks	2 10	" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super. "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "

HARD YORK—

Scappled random blocks	3 0	per ft. cube, "
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides ditto	3 0	" "
3 in. sawn two sides (slabs random sizes)	1 2	" "
3 in. self-faced random flags	0 5	" "

Hopton Wood (Hard Bed) in blocks 2 3 per ft. cube, deld. rly. depôt.
" " " 6 in. sawn both sides landings 2 7 per ft. super. deld. rly. depôt.
" " " 3 in. do. 1 2½ " "

SLATES.

in. in.	£ s. d.	
20 × 10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20 × 12 " "	13 17 6	" "
20 × 10 first quality "	13 0 0	" "
20 × 12 " " "	13 15 0	" "
16 × 8 " " "	7 5 0	" "
20 × 10 best blue Portmadoc	12 12 6	" "
16 × 8 " "	6 12 6	" "
20 × 10 best Eureka unfading green	15 17 6	" "
20 × 12 " "	18 7 6	" "
18 × 10 " "	13 5 0	" "
16 × 8 " "	10 5 0	" "
20 × 10 permanent green	11 12 6	" "
18 × 10 " "	9 12 6	" "
16 × 8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. " "
Best Brosely tiles	50 0	per 1000 " "
Do. Ornamental tiles	52 6	" " "
Hip and Valley tiles	4 0	per doz. " "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	per 1000 " "
Do. Ornamental do	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 " "
Do. Ornamental do	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1000 " "
Best Ornamental tiles	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "
Best "Hartshill" brand plain tiles, sand faced	50 0	per 1000 " "
Do. pressed	47 6	" " "
Do. Ornamental do	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 6	" " "

WOOD.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	15 10 0	16 10 0
Deals: best 3 by 4	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0
Foreign Sawn Boards—1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
⅞ in.	1 0 0	"

At per load of 50 ft.

Fir timber: best middling Danzig or Memel (average specification)	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	3 10 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0

JOINERS' WOOD. At per standard.

White Sea: first yellow deals, 3 in. by 11 in	23 0 0	24 0 0
3 in. by 9 in.	21 0 0	22 10 0
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0
" " 3 in. by 9 in.	17 10 0	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0
Do. 3 in. by 9 in.	18 0 0	19 10 0
Battens	13 10 0	15 0 0

WOOD (*continued*).

JOINERS' WOOD (*continued*)—	At per standard. £ s. d.	£ s. d.
Petersburg: second yellow deals, 3 in. by 11 in.	16 0 0	17 0 0
Do. 3 in. by 9 in.	14 10 0	16 0 0
Battens	11 0 0	12 10 0
Third yellow deals, 3 in. by 11 in.	13 10 0	14 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg :—		
First white deals, 3 in. by 11 in.	14 10 0	15 10 0
" " 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0
" " 3 in. by 9 in.	12 10 0	13 10 0
" " battens	9 10 0	10 10 0
Pitch-pine: deals	16 10 0	20 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	40 0 0	upwards.
Oddments	28 0 0	"
Seconds, regular sizes	30 0 0	"
Yellow Pine oddments	25 0 0	"
Kauri Pine—Planks, per ft. cube	0 3 6	0 5 0
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 6
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube.	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 9
¾ in. do. do.	0 0 7	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	0 1 0
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 6
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	17 0 0	21 0 0
American Whitewood Planks, per ft. cube	0 4 0	—
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	0 13 6
1 in. by 7 in. do. do.	0 14 0	0 18 0
¾ in. by 7 in. white do. do.	0 10 0	0 11 6
1 in. by 7 in. do. do. do.	0 11 6	0 13 6

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	5 15 0 ...	6 15 0
Compound Girders, ordinary sections	7 12 6 ...	8 15 0
Angles, Tees and Channels, ordinary sections	7 7 6 ...	8 7 6
Flitch Plates	7 15 0 ...	8 5 0
Cast Iron Columns and Stanchions including ordinary patterns	6 12 6 ...	7 15 0

METALS.

	Per ton, in London £ s. d.	£ s. d.
IRON—		
Common Bars	6 15 0 ...	7 5 0
Staffordshire Crown Bars, good merchant quality	7 5 0 ...	7 15 0
Staffordshire "Marked Bars"	9 10 0 ...	—
Mild Steel Bars	8 5 0 ...	8 15 0
Hoop Iron, basis price	8 15 0 ...	9 0 0
" " Galvanized	16 10 0 ...	—
("And upwards, according to size and gauge.)		
Sheet Iron, Black—		
Ordinary sizes to 20 g.	9 0 0 ...	—
" " 24 g.	10 0 0 ...	—
" " 26 g.	11 15 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality—		
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12 0 0 ...	—
Ordinary sizes to 22 g. and 24 g.	12 10 0 ...	—
" " 26 g.	13 10 0 ...	—
Sheet Iron, Galvanised, flat, best quality—		
Ordinary sizes to 20 g.	15 0 0 ...	—
" " 22 g. and 24 g.	15 10 0 ...	—
" " 26 g.	17 0 0 ...	—
Galvanised Corrugated Sheets—		
Ordinary sizes 6 ft. to 8 ft. 20 g.	12 0 0 ...	—
" " 22 g. and 24 g.	12 10 0 ...	—
" " 26 g.	13 5 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 0 0 ...	—
Best Soft Steel Sheets, 22 g. & 24 g.	12 0 0 ...	—
" " 26 g.	13 5 0 ...	—
Cut nails, 3 in. to 6 in.	8 10 0 ...	9 0 0
(Under 3 in., usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up	15 12 6 ...	—
Pipe in coils	16 2 6 ...	—
Soil pipe	18 12 6 ...	—
Compo pipe	18 12 6 ...	—
ZINC—Sheet—		
Vieille Montagne ton	28 0 0 ...	—
Silesian	27 15 0 ...	—
COPPER—		
Strong Sheet per lb.	0 0 10 ...	—
Thin " "	0 0 11 ...	—
Copper nails "	0 0 10 ...	—
BRASS—		
Strong Sheet "	0 0 9½ ...	—
Thin "	0 0 1[illegible] ...	—
TIN—English Ingots "	0 1 3½ ...	—
SOLDER—Plumbers'† "	0 0 6½ ...	—
Tinmen's "	0 0 8 ...	—
Blowpipe "	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¼d. per ft. delivered.
" fourths	2d. " "
21 oz. thirds	3¾d. " "
" fourths	3d. " "
26 oz. thirds	4¾d. " "
" fourths	3¾d. " "
32 oz. thirds	5¾d. " "
" fourths	5d. " "
Fluted Sheet, 15 oz.	3¼d. " "
" 21 oz.	4¼d. " "
⅛ Hartley's Rolled Plate	2d. " "
3/16 " " "	2¾d. " "
¼ " " "	2¾d. " "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 1 5
" " in barrels	"	0 1 6
" " in drums	"	0 1 8
Boiled " in pipes	"	0 1 7
" " in barrels	"	0 1 8
" " in drums	"	0 1 10
Turpentine, in barrels	"	0 3 4
" in drums	"	0 3 6
Genuine Ground English White Lead	per ton	19 5 0
Red Lead, Dry	"	18 15 0
Best Linseed Oil Putty	per cwt.	0 6 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 12s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to J. MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder" by *Friday Morning's Post*.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted, unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ARDEE (Ireland).—For alterations at the Workhouse, for the Guardians. Mr. L. Turley, C.E., architect, 17, Laurence-street, Drogheda:—

Collins Bros.	£118
P. J. Caffrey, James-street, Drogheda*	109

ASHBORNE.—For a 12-inch borehole at waterworks for a depth of 100ft., for the Urban District Council:—

A. C. Potter & Co., Lant-street, Borough, London, S.E.	£210

ASHWICKE (near Chippenham).—For new drainage scheme. Mr. T. J. Moss-Flower, C.E., engineer, Carlton-chambers, Bristol, and Victoria-street, Westminster, S.W.:—

Chancellor & Sons, Bath	Accepted on a schedule of prices.

BRIDGE (near Canterbury).—For alterations to the kitchen, boiler house, and laundry at the Workhouse, for the Guardians of Bridge Union. Mr. A. Bromley, architect, Radnor-chambers, Folkestone:—

Gann & Co.	£377 0 0	I. W. Woodhall & Son	£307 15 0
A. J. Brewster	339 15 0	W. J. Adcock	297 7 11
Sturry Building Co.	331 13 8	H. J. Belsey	296 0 0
H. J. Smith & Son	327 17 4	G. Castle & Son	290 0 0
C. J. Howland	324 5 8	S. Browning	274 0 0
C. Mount	317 9 4	W. Baker & Co.	273 19 0
Hayward & Paramor	315 3 4	C. G. Townsend, Deal†	£65 0 0

BRIDGWATER.—For new sewer and branch drains to houses in Provident-place, for the Town Council. Mr. F. Parr, Borough Surveyor. Quantities by Borough Surveyor:—

Gleed Bros.	£125 East-side; 126 West-side
T. Stockham	109 East-side; 109 West-side
W. Haysham	98 East-side; 108 West-side
S. Palmer	92 East-side; 91 West-side
C. Bryer, Friam-street, Bridgwater*	82 East-side; 90 West-side

BRISTOL.—For reconstructing the sanitary arrangements and other work at Cotham, Bristol, for Mr. R. Neilson. Mr. T. J. Moss-Flower, C.E.,* engineer and surveyor, Carlton-chambers, Bristol, and 2, Victoria-mansions, Westminster, S.W.:—

L. Thomas & Sons	£460	W. G. Mithell & Co., Bristol*	£296
Perkins & Sons	330		

BUSHEY (Herts).—For constructing a small continuous filter at the disposal works in Hamper Mill-lane, for the Watford Rural District Council. Mr. E. Lailey, engineer, 9, Market-street, Watford:—

G. R. Mann	£423 13 0	Bracey & Clark	£399 0 0
Clark Bros.	420 0 0	H. Brown, Watford*	380 0 0
F. P. Bliss	418 0 0		
G. Pilkin	410 7 11		

CHEW MAGNA.—For repairing, etc., church, for the Committee for the Cleaning and Repairing the Parish Church:—

E. Cobston	£152 10	C. A. Williams & Sons, Bishopston, Bristol*	£97 0
E. T. Hathaway	115 0		
F. A. R. Woodward	172 0		

CORK.—For rebuilding the engine and pump house, and building additions, etc., to boiler house at pumping station, Lee-road, for the Town Council. Mr. J. F. Delany, City Engineer. Quantities by Engineer:—

M. Barry, 3, Camden-quay, Cork*	£2,938 2 2

COULSDON (Surrey).—For forming new road at Smithambottom-lane:—

G. S. Faulkner	£1,413 14 6	S. Kavanagh & Co.	£948 0 0
F. Fowles	1,300 0 0	G. Bell	929 0 0
C. Castle & Co.	1,220 0 0	Fry Bros.	875 0 0
J. Jackson	1,188 0 0	E. B. Yewen, Croydon*	875 0 0
F. Thacker	1,167 0 0	T. Free & Sons	860 0 0
W. Neave & Son	1,154 0 0	C. W. Killingback & Co.	857 0 0
H. Williams	1,150 0 0	F. White	841 5 4
E. Iles	1,087 0 0	W. Hall	788 14 0
T. Adams	996 0 0		
J. C. Trueman	995 0 0		

COWPEN.—For making Princess Louise-road, for the Urban District Council. Mr. R. Grieves, Surveyor, Cowpen:—

G. E. Simpson	£369 7 3	J. Robson	£327 10 3
Henderson & Armstrong	359 0 0	McLaren & Co., Christon Bank*	311 4 3
J. Shannon	328 19 2		

CROFTON.—For paving channels at Crofton, for the Cowpen Urban District Council. Mr. R. Grieves, Surveyor to Council, Cowpen:—

	s. d.
McLaren & Co., Christon Bank	5 9 per sq. yard.

EASTLEIGH (Hants).—For alterations and additions to Drill Hall, Desborough-road. Messrs. Lemon & Blizard, architects, Lansdowne House, Castle-lane, Southampton:—

W. Whitehead	£2,092 18 0	W. Jupe	£1,578 8 7
J. Treherne	2,022 14 10	H. J. Hood	1,576 17 5
G. Pierce	1,872 19 3	T. H. Stiles	1,549 0 0
Bagshaw & Sons	1,668 9 9	Jenkins & Sons	1,520 0 0
Rashley & Sons	1,585 0 0	T. J. Jukes	1,500 0 0
H. Stevens & Co.	1,584 0 0	Wort & Way	1,495 0 0
		J. Nichol, Southampton*	1,494 0 0

[Architects' ..... £1,600.]

FISHPONDS (Bristol).—For builder's work at new works, for the Avonside Engine Company:—

J. James, 166, Stapleton-rd., Bristol	£1,548

GREAT BERKHAMSTED.—For erecting new school for girls in Prince Edward-street, for the Managers of the Maintained Schools. Messrs. C. H. and N. A. Rew, architects, 185, High-street, Great Berkhamsted. Quantities by architects:—

J. & M. Patrick	£3,899 0	W. & D. Wilkins	£2,395 0
D. Osbourn & Son	2,850 0	J. Honour & Son	2,347 0
G. W. Johnson	2,774 10	A. Timberlake	2,325 0
H. Flint	2,717 0	R. L. Tonge & Co.	2,307 0
Nash, Young, & Horne	2,700 0	G. & J. Waterman	2,250 0
Orchard & Son	2,694 0	S. Hipwell & Co.	2,200 0
R. Jones & Son	2,665 0	W. Payne	2,195 0
D. Parkins	2,598 0	J. Ward & Son	2,130 10
G. H. Gibson	2,520 0	H. & J. Matthews, Berkhamsted*	2,128 0
A. W. Nash	2,431 0	W. Judge	1,950 0
T. Tirrell	2,397 0		

[Architects' estimate, £2,250.]

GRIMSBY.—For extension of Corporation watermains (Contract No. 2). Mr. H. Gilbert Whyatt, A.M.I.C.E., Borough Engineer and Surveyor:—

H. Mason	£920 1 8	Hewins & Goodhand	£594 17 0
Tabor	884 17 0	Grimsby Waterworks Co., Grimsby*	580 0 0
T. C. Starkey	856 4 1	B. Robinson	575 18 11
W. Burkitt	693 0 10	J. Sangwin	561 6 6
Medforth	689 12 6		
T. Borrill	652 10 4		
H. Ashley	596 0 0		

HOUNSLOW.—For paving works, Hounslow and Isleworth, for the Heston and Isleworth Urban District Council. Mr. P. G. Parkman, Surveyor, Town Hall, Hounslow, W.:—

Harvey Bros., Westminster	£736 8 6

KENDAL.—For sewerage works, for the Corporation. Mr. R. Hampton Clucas, C.E., Borough Engineer, Town Hall, Kendal. Quantities by Engineer:—

W. Canadice	£822 12 8
T. & W. Dirkin, Kendal*	583 16 0

LONDON.—For new banking premises, Mare-street, Hackney, for the London and South Western Bank, Ltd. Mr. W. Bramham, architect:—

W. Silk & Son	£7,925	Snewin Bros. & Co.	£7,182
H. J. Williams	7,487	E. H. Roome & Co.	7,100
G. Wales & Co., Ltd.	7,398	W. Shurmur & Sons, Ltd.	6,948
C. Dearing & Son	7,376		
C. W. Barker	7,350		

TENDERS.—*Continued on page* 535.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be Delivered
*New Police and Fire Brigade Stations	City & County of Bristol Watch Com.	Not stated	No date.
Wesleyan Chapel and School, Harehill's-lane, Leeds	.....	Send names to Rev. N. J. Willis, Richmond-hill, Leeds	do.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Classroom, Moortown Council School	Leeds Education Committee	W. S. Braithwaite, Architect, Education Offices, Leeds	Nov. 19
Alterations to Canton Liberal Institute	.....	Secretary, 301, Cowbridge-road, Canton, Cardiff	do.
Stores	Tyne Improvement Commission ..	Engineer to Commissioners, Bewick-street, Newcastle-on-Tyne ..	do.
Repairs, etc., at South End Provided School, Elland	Education Com. West Riding C.C..	J. Vickers-Edwards, County Architect, County Hall, Wakefield ..	Nov. 21
Public Offices and Depôt, Solihull	Solihull R.D.C.	A. E. Cursall, Surveyor, The Square, Solihull	do.
700 Tons of Granite Setts	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, Tynemouth	do.
750 yds. of Channel Blocks	do.	do.	do.
75 Sluice Valve Hydrants, etc.	Beckenham U.D.C.	J. A. Angell, Surveyor, Beckenham	do.
Public Baths, Selby Oak	King's Norton & Northfield U.D.C.	A. W. Cross, Engineer, 23, Valentine-road, King's Heath	do.
Rebuilding Colliers' Arms Hotel, Nantyffyllon	Rhondda Valley Breweries Co.	Collier's Arms, Maesteg	do.
Work at Cottage Homes, Bryncoch	Neath Guardians	D. M. Davies, Architect, Orchard-place, Neath	do.
Machine Tools	Newport (Mon.) Corporation	Borough Electrical Engineer, Town Hall, Newport, Mon.	do.
Tramway Rail Bonds	Manchester Tramways Committee..	J. M. M'Elroy, Manager, Tramways Dept., 55, Piccadilly, Manchester	do.
Painting at Workhouse, Brownlow-hill	Liverpool Select Vestry	Parish Offices, Liverpool	do.
Additions, Welbeck-road Council School, St. Anthony's	Newcastle-on-Tyne Education Com.	J. W. Thompson, Architect, 63, Grey-street, Newcastle-on-Tyne	do.
Tenements, Gray-street, Perth	Mr. J. Craik	A. G. Chalmers, Architect, Perth	do.
Renovations, Repairs, etc., Haddiscoe Hall, Norfolk	Mr. E. Morse	A. Pells, F.S.I., Architect, Beccles	do.
Movable Screen, etc., Infants' School, Albert-street	Bridgwater Education Committee..	Borough Surveyor, Municipal Buildings, High-street, Bridgwater	do.
Wrought Iron Tubes and Fittings	Wilmslow & Alderley Edge Gas Co.	W. Severs, Engineer, Gasworks, Wilmslow	Nov. 22
Sewage Works, Haydon Bridge	Hexham R.D.C.	J. H. Nicholson, Clerk, Midland Bank-chambers, Hexham	do.
Roadworks, Linden-road	Leatherhead U.D.C.	T. Salkield, Surveyor, Council Offices, Leatherhead	do.
Electric Lighting: Contract V., Piping	Deptford Borough Council	F. H. Medhurst & Lloyd, Engrs., 13, Victoria-st., Westminster, S.W.	do.
Making-up Frederick-street and Cowood-street	Swinton U.D.C.	R. Fowler, Surveyor, Council Offices, Swinton, near Rotherham..	do.
Reconstruction of Two Tenements, Greenside	Edinburgh City Council	Borough Engineer, City-chambers, Edinburgh	do.
70 lineal yards of 9-in. Sewer at Dinas	Rhondda U.D.C.	W. J. Jones, Engineer, Public Offices, Pentre, Rhondda	do.
Twenty Cottages at Chopwell	Consett Iron Co.	C. E. Oliver, Architect, Consett	do.
Twelve Cottages at Leadgate	do.	do.	do.
Timber for Hall Show	Yorkshire Agricultural Society	J. Maughan, Secretary, Blake-street, York	do.
600 yds. of Stoneware Sewer, etc.	Colwall Parochial Committee.....	T. G. Calnk, Engineer, 95, High-street, Worcester	do.
800 yds. super. of Cement Concrete Paving Flags ..	Sheerness U.D.C.	V. H. Stallon, Clerk, Council Offices, Trinity-road, Sheerness....	do.
Additions, etc., to House, Goxhill, Lincs.	.....	Mr. E. Goodhand, Architect, Osborne-chambers, Grimsby	do.
Wellington-street Storm-water Sewer	Birmingham Public Works Com. ..	J. Price, City Engineer, Council House, Birmingham	Nov. 23
Sewerage Extension (Contract No. 4)	Fulwood U.D.C.	E. H. Naylor, Engineer, Fulwood, Lancashire	do.
Mineral and Colza Oil in Scottish Districts	.....	Chief Staff Officer, Headquarters, Scottish District, Edinburgh ..	do.
17½ Tons of C.-I. Pipes, Valves, etc., Glen-Urquhart	Inverness-shire County Council	R. Black, Engineer, 22, Union-street, Inverness	do.
4¼ Miles of Pipe Track Work	do.	do.	do.
Deck Bridges (40-ft. Spans)	East Indian Railway Co	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
River Crossing at Clayton New-road	Manchester Improvement, etc., Com.	City Surveyor's Office, Town Hall, Manchester	do.
Four Houses, Villa-road, Donaghadee	.....	T. Houston, Architect, Kingscourt, Wellington-place, Belfast	do.
Tar Asphalting, Promenade Widening Works	Blackpool Highway Committee	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
Boundary Wall, etc., Cameron Memorial Hospital ..	West Hartlepool Hospital	Clerk of Works at Hospital, Serpentine-road	do.
House, Albert-road, Consett	Mr. J. Murray	T. H. Murray, Architect & Surveyor, Consett, Durham	do.
Stable and Warehouse, Nile-street, Consett	do	do.	do.
*Supply of Brick Burrs	West Ham Guardians	Clerk's Office, Union Workhouse, Leytonstone, N.E.	do.
Six Rustic Shelters, Heaton Park	Manchester Parks Committee.....	City Architect, Town Hall, Manchester	Nov. 24
White Lead, Store Premises, Kingstown, co. Dublin	Commissioners of Irish Lights	O. Armstrong, Secretary, Irish Lights Office, Dublin	do.
Removal of Ashes, etc., Abbey Mills Pumping Station	London C.C.	M. Fitzmaurice, Engineer, County Hall, Spring Gardens, S.W. ..	do.
Removal of Ashes, etc., Albert-road, N. Woolwich	do.	do.	do.
Asphalte Paving Works, London Fields	Hackney Borough Council	Norman Scorgie, Borough Engineer, Town Hall, Hackney, N.E...	do.
*Iron Coal Bunker at Whipp's Cross-road Infirmary..	West Ham Guardians	Clerk's Office, Union Workhouse, Leytonstone, N.E.	do.
Fire-escape Staircases at Workhouse	Merthyr Tydfil Guardians	T. Roderick, Architect, Aberdare and Merthyr	Nov. 25
Scavenging and Watering	Hull Corporation	City Engineer, Town Hall, Hull	do.
Cartage	do.	do.	do.
Materials, etc.	do.	do.	do.
Six Terrace Houses, Deighton-lane, Batley	Co-operative Society, Ltd., ...	H. B. Buckley, Architect, 85, Commercial-street, Batley	do.
*New Coastguard Building at Peel, Isle of Man	Admiralty	Works Department, Admiralty, 21, Northumberland-avenue, W.C.	do.
*New Coastguard Building at St. Peters, Lincoln	do.	do.	do.
*New Coastguard Building at Ingoldmells, Lincoln ..	do.	do.	do.
Making-up Raby-road, etc.	Maldens and Coombe U.D.C.	T. B. Simmons, C.E., Council Offices, Cambridge-rd., New Malden	Nov 26
Steam Rollers and Scarifiers, etc.	Kent C.C.	County Surveyor, Maidstone	do.
Tramway Rails, etc.	Leith Coporation	T. B. Laing, Town Clerk, Council-chambers, Leith	do.
Tramway Cars	do.	do.	do.
Main Pipe Sewer at Walton	Wakefield R.D.C.	F. Massie, Architect, Tetley House, Kirkgate, Wakefield	do.
Main Pipe Sewer at Alverthorpe	do.	do.	do.
Cartage	Felling U.D.C.	Surveyor, Council-buildings, Felling, R.S.O., Durham	do.
Stores	do.	do.	do.
Fencing at Saughton Park	Edinburgh City Council	Public Works Office, City-chambers, Edinburgh	do.
Steel Water-chute, South Shore, Blackpool	.....	Garlick & Sykes, Engineers, 22, Birley-street, Blackpool	Nov. 28
Urinals, Closets, etc., for New Conveniences	Warrington Corporation	Borough Surveyor, Town Hall, Warrington	do.
Road Metal for One Year	Elgin County Council	A. Hogg, County Road Surveyor, 24, Academy-street, Elgin	do.
Wrought Iron Railings and Gates, Esplanade Gardens	Exmouth District Council	S. Hulton, Surveyor, District Council Offices, Exmouth	do.
Guernsey Granite, Town Quay, Cowes, Isle of Wight	Cowes U.D.C.	J. W. Webster, Surveyor to the Council	do.
Stores	Great Northern Railway Co.	Stores Superintendent, Doncaster	do.
Painting Twenty Cottages, Mozart-street	West Hartlepool Corporation.....	N. F. Dennis, Borough Engineer, West Hartlepool	do.
Laying-out Pleasure Grounds, Grosvenor-road	Aldershot U.D.C.	F. C. Uren, Engineer, Victoria-road, Aldershot	Nov. 29
Underground Sanitary Convenience, Plaistow	West Ham Corporation	Borough Engineer, Town Hall, West Ham, E.	do.
Painting, etc., Hunslet Baths	Leeds Corporation	City Engineer's Office	do.
Alterations, etc., to Station Buildings, Penally	Great Western Railway Co.	Engineer at Neath Station	do.
Cottage at Penally	do.	do.	do.
1¼ Miles of Railway, Garnant, South Wales	do.	Engineer, Paddington Station, London	do.
*Goods Shed, Avonmouth, near Bristol	do.	The Company's Engineer, Bristol Station	do.
House, Grange-over-Sands	Mr. W. Dalgleish	Settle & Brundrit, Architects & Surveyors, Ulverston	do.
Colour., Paint., etc., Royal Bath Hos., etc., Harrogate	Committee of Management.....	At Hospital	Nov. 30
Cottages on Hale Moss	Altrincham U.D.C.	J. Stokoe, Clerk, Town Hall, Altrincham.....	do.
Excavat. 8¼ Miles of Trench for 18-in. Cast-Iron Pipes	Staffordshire Potteries Waterwks. Co.	G. D. Harrison, Engineer, Albion-street, Hanley	do.
3,000 ft. lineal of Granite Kerbing	Hove Town Council	H. H. Scott, Borough Surveyor, Town Hall, Hove.....	do.
*Granite Kerbing and Channelling	Borough of Hove	do.	do.
Street Works, King's Heath and Selby Wick	King's Norton, etc., U.D.C.	A. W. Cross, Surveyor, 23, Valentine-road, Kings's Heath	do.
Alterations, etc., Wheatsheaf Hotel, Beetham.....	Mr. C. Frith-Hudson, J.P.	S. Shaw, F.R.I.B.A., Kendal	do.
28,000 gallons of Heavy Mineral Oil	Commissioners of Irish Lights	O. Armstrong, Secretary, Irish Lights Office, Dublin	Dec. 1
30,000 gallons of Mineral Oil	do	do.	do.
Children's Homes, Ryhall-road	Stamford Guardians.....	Mr. Ward, Architect, Stamford	do.
*New House at Greenock	Admiralty	Director of Works Depart., 21, Northumberland-avenue, W.C.	Dec. 2
Stores	Thames Conservators	Conservators' Offices, Victoria Embankment, E.C.	Dec. 3
Sewage Disposal Works	Alderley Edge U.D.C.	J. Newton, Son, & Bailey, Engineer, 17, Cooper-st., Manchester	Dec. 5
Colliery Stores	South Hetton Coal Co., Ltd.	J. R. Lambert, South Hetton, Sunderland	do.
Norway Granite Kerb, Hornchurch	Romford R.D.C.	G. Lapwood, Highway Surveyor, Victoria-road, Romford	do.
320 ft. of Kerbing, Cranham	do.	do.	do.
2,300 ft. of Kerbing, Clock House-road, Upminster	do.	do.	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered.
Open Storage Reservoir	Settle R.D.C.	T. A. Foxcroft, Surveyor, Town Hall, Settle	Dec. 5
Widening Hanwell County Bridge	Middlesex C.C. Highways Com.	H. T. Wakelam, Co. Engr., Middlesex Guildhall, Westminster, S.W.	do.
Materials	Cadbury Bros., Ltd.	Bournville, Birmingham	do.
*Building of Water Tower	East Cowes U.D.C. (Isle of Wight)	Council's Surveyor, Town Hall, East Cowes	Dec. 7
*New Engine House, etc.	do.	do.	do.
*Engine Suction and Gas Plant	do.	do.	do.
*6-in. Mains from Waterworks to Tower	do.	do.	do.
*Taking-out and Refixing Old Pumps	do.	do.	do.
*Set of 8-in. 3-Throw Deep Well Pumps, etc.	do.	do.	do.
Boiler Tubes, Brass and Copperwork, etc.	City of Dublin Steam Packet Co.	Office of Company, 15, Eden Quay, Dublin	do.
*New School	Hereford Education Committee	Ghoel Barker, Architect, 146, St. Owen-street, Hereford	Dec. 8
*Enlargement of Eastern District Post Office, London	Commissioners of H.M. Works, etc.	J. Wager, H.M. Office of Works, Storey's-gate, S.W.	do.
*Erection of Electrical Traveller	Mr. B. E. Nightingale	.....	Dec. 10
*Supply of Furniture for Schools	Croydon Education Committee	The Clerk, Katherine-street, Croydon	do.
Mechan.-operated Gates, West-st. Ballast Whf. Sidings Road Material	Erith U.D.C.	C. H. Fry, Clerk, District Council Offices, Erith, Kent	Dec. 12
Prestbury Sewerage	Kent County Council	County Surveyor, Maidstone	Dec. 17
*New Board-room and General Offices	Cheltenham R.D.C.	Nicholson Lailey, Engineer, 6, The Sanctuary, Westminster, S.W.	Dec. 20
*Heating, Ventilating, and Hot-Water Plant, Epsom	River Wear Commissioners	Henderson & Ball, Architects, 28, John-street, Sunderland	Jan. 4-05
Governor for a 50-h.p. Single Vortex Water Turbine	L.C.C. Asylums Committee	The Clerk, 6, Waterloo-place, S.W.	Jan. 23-05
Houses, Lower Bucksburn	Knaresborough U.D.C.	T. Mainman, Clerk to Council	No date.
Engines, Dynamos, etc., at Lunatic Asy., Bromsgrove	.....	Mr. Mackie, Quarry Lodge, Bucksburn, N.B.	do.
Storage Battery, etc., at Lunatic Asy., Bromsgrove	Worcestershire County Council	R. J. Oliver, Clerk to Visiting Committee, Shirehall, Worcester	do.
Main Switchboard, etc., at Lunatic Asy., Bromsgrove	do.	do.	do.
Ten Houses, Oak Ley-road, Long Eaton	do.	do.	do.
	.....	E. B. Ridway, Architect, Main-street, Long Eaton	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Clerk of Works	Southampton County Council	3*l.* per week, etc.	Nov. 25
*Assistant Examiners in Patent Office	Civil Service Commission	Not stated	Dec. 15

Those marked with an asterisk (*) are advertised in this number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xvii.

TENDERS.—*Continued from page 533.*

LONDON.—For repairing roads and repairing tar paving at the Northern (Convalescent) Fever Hospital, Winchmore-hill, N., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

Northern Hospital—Road-making and other works.

J. Wainwright & Co.	£2,269 10	R. Ballard, Ltd.	£777 0
F. Fowles	1,400 0	Grounds & Newton, Page Green-road, South Tottenham*	470 0
T. Adams	995 0		
G. Bell	947 0		

Northern Hospital—Repairs to tar-paving.

F. Fowles	£525 0	Grounds & Newton	£235 0
Atlas Stove Co., Ltd.	430 0	J. Smart & Son	234 17
T. Adams	345 0	Constable, Hart, & Co., Ltd.	158 0
J. Wainwright & Co., Ltd.	326 0	Vickers & Field, 25, Victoria-st., W'tm'st'r, S.W.*	139 19
F. G. Sheppard	300 0		
Goddard & Co.	298 10		

LONDON.—For making-up Loxwood and Radley roads, for the Tottenham Urban District Council. Mr. W. H. Prescott, Engineer, Coombes Croft House, 712, High-road, Tottenham:—

	Radley-road.	Loxwood-road.
T. Adams	£501 8 9	£423 4 11
T. Rowley, jun.	487 4 11	406 17 9
Grounds & Newton	481 5 0	396 9 6
Harvey Bros.	460 7 4	386 4 8
E. Frost	441 0 6	—
C. Bloomfield	421 1 2	344 11 0
E. T. Bloomfield, Tottenham*	375 13 4	302 11 4

LONDON BOARD OF EDUCATION TENDERS.

For cleaning schools during the Christmas holidays, 1904:—

Battersea, Bolingbroke-road.

R. E. Williams & Sons	£343 0	E. Triggs	£159 0
J. Carmichael	220 0	C. Gurling	152 0
E. Flood	203 10	W. Johnson & Co., Ltd., Wandsworth-common*	145 0
R. S. Ronald	200 0		
R. A. Jewell	184 0		

Battersea, Gideon-road.

F. G. Minter	£270	R. S. Ronald	£205
E. Flood	242	J. Garrett & Son	165
R. E. Williams & Sons	233	W. Johnson & Co., Ltd., Wandsworth-common*	158
E. B. Tucker	215		
J. Carmichael	215		

Bethnal Green, S.W., Hague-street.

A. J. Sheffield	£218 0	R. Woollaston & Co.	£178 0
Woollaston Bros.	213 0	Barrett & Power, St. Thomas' Wrks., Hackney*	175 0
H. Bouneau	212 10		
C. Willmott & Son	204 10		
J. Haydon & Sons	190 8		

Finsbury, E., Baltic-street.

Parrott & Isom	£291 0 0	J. Greenwood, Ltd.	£161 17 6
Thompson & Beveridge	204 0 0	W. Chappell	148 0 0
H. Runham Brown	197 0 0	W. Brown & Sons, 195, Uxbridge-road*	122 0 0

Finsbury, E., Chequer-street.

H. Runham Brown	£206 0 0	J. Greenwood, Ltd.	£163 18 6
Vigor & Co.	182 10 0	W. Chappell	149 0 0
H. Bouneau	180 15 0	W. Brown & Sons, 195, Uxbridge-road*	147 0 0
Stevens Bros.	164 10 0		

Fulham, Everington-street.

W. Hornett	£299 10	F. Chidley & Co.	£232 0
C. F. Kearley	297 0	W. R. & A. Hide	230 5
G. Neal	285 0	General Builders, Ltd., Wharf-road, Nottinghill*	103 0
S. Polden	262 0		
F. G. Minter	252 0		
W. Hammond	243 0		
F. T. Chinchen & Co.	238 15		

Hackney (Central), Queen's-road.

W. Shurmur & Sons	£432 0	Barrett & Power	£290 0
W. Silk & Son	389 0	J. Stewart	275 10
McCormick & Sons	370 0	F. Bull	269 0
A. J. Sheffield	310 0	Woollaston Bros., 22, Rockmead-road, Hackney*	236 10
C. Willmott & Son	297 5		

Islington, E., Blackstock-road.

T. Cruwys	£319	F. W. Harris & Co., Ltd.	£225
Patman & Fotheringham, Ltd.	285	J. Grover & Son	224
McCormick & Sons	272	Marchant & Hirst, 136, Highgate-rd.*	218
G. Kirby	248		
A. Porter	243		

Lewisham, Haseltine-road.

H. Leney & Son	£325 0 0	E. P. Bulled & Co.	£220 0 0
W. J. Howie	325 0 0	J. & C. Bowyer, Westow-st., Upper Norwood*	219 0 0
C. G. Jones	285 0 0		
W. Banks	254 12 6		
C. J. Gerrard	250 0 0		

Marylebone, W., Bell-street.

Thompson & Beveridge	£244 0	Bristow & Eatwell	£187 0
G. Foxley	241 15	F. T. Chinchen & Co.	184 0
G. Neal	195 0	F. Chidley & Co.	175 0
W. Densham & Sons	189 0	W. Chappell, 243, Elgin-avenue*	160 0

Peckham, Reddin's-road.

H. J. Williams	£342 10	J. Greenwood, Ltd.	£169 0
W. Sayer & Son	245 0	J. & C. Bowyer	169 0
W. J. Howie	214 0	J. Garrett & Son, 17, Balham-hill	153 0
E. P. Bulled & Co.	175 0		
Maxwell Bros. Ltd.	175 0		

Rotherhithe, Farncombe-street.

W. Sayer & Son	£308 0	Rice & Son	£249 0
E. Triggs	273 0	J. Garrett & Son	237 0
J. Greenwood, Ltd.	262 0	H. Groves, Stockwell-st., Greenwich*	225 0
E. P Bulled & Co.	257 0		
W. Banks	249 10		

Walworth, Victory-place.

W. Hornett	£297	J. F. Ford	£197
H. J. Williams	295	J. Appleby & Sons, Cornwall Works, Lambeth*	184
T. L. Green	294		
W. Sayer & Son	211		
Maxwell Bros., Ltd.	209		

Wandsworth, Swaffield-road.

Hudson Bros.	£345	R. S. Ronald	£260
R. A. Jewell	314	Lathey Bros.	259
J. & M. Patrick	313	E. Triggs, 92, The Chase, Clapham*	241
W. & C. Brown	295		
W. Johnson & Co., Ltd.	269		

Woolwich, Conway-road.

Enness Bros.	£279 0 0	W. J. Howie	£189 0 0
Holliday & Greenwood, Ltd.	235 0 0	H. Groves	184 0 0
W. Hayter & Son	209 10 0	E. Proctor & Son, 328, High-street, Plumstead*	172 0 0
W. Banks	189 12 6		

LONDON.—For proposed farrier's shop, Peckham Rye, S.E., for Messrs. Tilling, Ltd. Mr. W. Leonard Dowton, architect, City Bank-chambers, Bedford-row, W.C.:—

B. W. Sheffield	£460	Battley, Sons, & Holness	£380
C. Ansell	424	G. Parker†	375
W. T. Champion	424		

[All contractors are local men.]

NEWARK.—For erecting a mission hall and additions to schools, Barnby-road. Messrs. Sheppard & Harrison, architects, Bargate, Newark:—

W. Smith	£589 10	F. Crosslan	£529 0
H. Hurst	535 0	G. Brown & Sons	509 0
G. Henderson	534 19	C. Baines*	485 0

[All of Newark.]

OMAGH (Ireland).—For alterations to old chapel at the Omagh District Asylum, for the Joint Committee of Management. Messrs. Doolin, Butler, & Donnelly, architects, Dawson-chambers, Dawson-street, Dublin:—

J. Robinson, Omagh £525

PENRHIWCEIBER.—For constructing 9-in. pipe sewer and lanes on the Pentwyn Isaf Estate. Mr. P. E. Hill, surveyor, 23, St. Mary-street, Cardiff:—

E. Lewis	£160 0 0	Webb & Son	£125 14 0
J. Sutherland	128 6 3	Osmond & Sons	123 1 6

PENZANCE.—For alterations and additions to two shops at 35, Causeway-head, for Mr. B. Downing. Mr. H. Maddern, architect, 13, Clarence-street, Penzance:—

Whole.

G. H. Davis	£386 0	R. Hosking	£328 12
J. Nicholas	376 3		

Masonry Only.

J. Richards, Barwis Hill* £156 9

Carpenter and Painter.

J. Berryman, Heamoor* £163 8

PUDSEY.—For sewerage works, Contract No. 23, at Fulneck, for the Corporation. Mr. J. Jones, Borough Surveyor, Church-lane, Pudsey. Quantities by the Borough Surveyor:—

Harold Arnold & Son, Building and Engineering Contractors, Leeds and Doncaster £1,015

SOUTHALL.—For making-up part of Avenue-road, for the Urban District Council of Southall-Norwood. Mr. R. Brown, Engineer and Surveyor, Public Offices, Southall:—

Kavanagh	£909 4 9	Mowlem & Co.	£736 0 0
H. Morecroft	898 0 0	T. Watson	715 5 6
Harvey Bros.	866 2 0	T. Fred & Sons	711 3 6
Thacker	804 8 0	A. & B. Hanson, Southall†	700 0 0
P. S. Gibbons	745 17 6		

[Surveyor's estimate, £734.]

SOUTHALL.—For erecting porter's lodge at the Sanatorium, North-road, for the Urban District Council of Southall-Norwood. Mr. R. Brown, Engineer and Surveyor, Public Offices, Southall:—

Ferguson & Co.	£448 19	A. & B. Hanson	£353 0
W. J. Dickens	430 0	Booth, Southall*	335 10
Sansom & Bishop	425 0		

[Surveyor's estimate, £335.]

SURBITON.—For 250 yds. of 12-in. and 9-in storm-water drains, etc., and taking out old portion of drain, Brighton-road, for the Urban District Council. Mr. Samuel Mather, Surveyor:—

F. Hoffman	£300 10 0	W. J. Logan, Foots Cray*	£192 0 0
S. Atkins	298 0 0		
Kavanagh & Co.	285 16 3		

TWICKENHAM.—For street works, Cresswell, Denton, and Orchard roads, and Waldegrave-gardens, for the Urban District Council. Mr. F. W. Pearce, Surveyor, Town Hall, Twickenham :—

	Cresswell-road.	Denton-road.	Orchard-road.	Waldegrave-gardens.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
F. Hoffmann	627 15 0	250 15 0	833 0 0	586 13 0
H. Bentham	550 0 0	214 0 0	805 0 0	579 0 0
J. Howell & Co.	769 5 0	300 0 0	733 17 4	517 0 0
Harvey Bros.	616 12 7	236 15 5	708 3 8	491 17 8
F. Thacker	524 0 0	208 0 0	690 0 0	‡465 0 0
S. Kavanagh & Co.	592 0 0	223 0 0	688 0 0	510 0 0
T. Watson, jun.	502 15 0	197 10 0	678 4 3	505 8 7
T. Adams	538 0 0	209 0 0	669 0 0	539 0 0
J. Mowlem & Co.	512 0 0	195 0 0	574 0 0	477 0 0*
W. H. Wheeler	478 16 10	201 4 10	529 8 6	483 0 0
G. Wimpey & Co.	499 0 0*	191 0 0*	495 0 0*	495 0 0
Surveyor's estimate	599 4 5	208 18 4	766 11 4	546 10 5

‡ Not in accordance with amended specification.

SOUTHAMPTON.—For alterations and additions to the Headquarters, Drill Hall, St. Mary's-road, Southampton, for the 1st Hampshire Royal Garrison Artillery Volunteers (Lieut.-Col. J. H. Harrison Hogge, Officer Commanding). Messrs. Lemon & Blizard, architects, Lansdowne House, Castle-lane, Southampton. Quantities by Mr. J. Henry Blizard, A.M.Inst.C.E., etc. :—

Rashley & Sons	£2,188 0 0	H. J. Hood	£1,950 0 0
J. Treherne	2,127 0 0	J. Nichol	1,949 0 0
T. J. Jukes	2,077 0 0	Bagshaw & Sons	1,948 13 8
H. Stevens & Co.	2,055 0 0	Wort & Way	1,931 4 6
Dyer & Sons	2,045 0 0	T. H. Stiles	1,924 0 0
Jenkins & Sons	1,967 0 0	G. R. Long	1,923 0 0
		W. Jupe, S'thampt'n*	1,760 15 3

[Architects' ..... £2,100.]

SWANAGE.—For constructing a retaining wall (second section) along the Shore-road, for the Urban District Council. Mr. J. Sidney, Senior Surveyor to the Swanage Urban District Council:—

J. A. Bartlett	£2,238 0 0	Burt & Burt, Swanage*	£1,977 4 2
F. H. Parsons & T. Clark	2,085 0 0	F. Parsons‡	1,820 0 0
J. T. Whettham, jun.	2,067 0 0		

‡ Withdrawn.

TOTTENHAM. — For making-up Chalgrove-road (second section), Fawley and Lordsmead roads, for the Urban District Council. Mr. W. H. Prescott, Engineer, Coombes Croft House, 712, High-road, Tottenham :—

—	Chalgrove-road (2nd portion).	Fawley-road.	Lordsmead-road.
	£ s. d.	£ s. d.	£ s. d.
T. W. Pedrette	—	445 10 0	1035 11 10
E. T. Bloomfield, Tottenham	237 17 4	299 4 2	*649 2 10
Grounds & Newton	241 16 0	353 3 6	759 3 2
T. Adams	246 19 1	343 18 3	717 19 8
C. Bloomfield, Tottenham	*233 8 0	*292 19 0	704 13 8½
Harvey Bros.	316 14 10	457 0 3	862 10 1

TROEDYRHIW.—For renovation and enlargement of the English Wesleyan Church, for the Trustees. Mr. L. G. Tiley, architect :—

W. Spratt, Tony Pandy £450

WATFORD.—For pipes for water mains, for the Urban District Council. Mr. David Waterhouse, Council's Surveyor :—

J. Blakeborough & Sons, Brighouse.. £785 6 7

WELLINGBOROUGH.—For erecting a corn exchange, offices, refreshment-rooms, etc., for the Urban District Council. Mr. J. M. Sharman, architect, Market-square, Wellingborough :—

Goodman & Murkett, Wellingborough £5,100

WELLINGBOROUGH.—For providing and fixing cattle pens at new markets, for the Urban District Council. Mr. J. M. Sharman, architect, Market-square, Wellingborough :—

Cort, Paul, & Cornick, Leicester £1,135

WELLINGBOROUGH.—For levelling, draining, and paving site for cattle market, for the Urban District Council. Mr. J. M. Sharman, architect, Market-square, Wellingborough :—

Goodman & Murkett, Wellingborough £1,500

B. NOWELL & Co.,
Stone Merchants & Contractors.
Chief Office.—*Warwick Road, KENSINGTON.*
Norway, Guernsey, and Leicestershire Granite, Kerb, Pitching, and Yorkshire Stone.
ESTIMATES GIVEN FOR EVERY DESCRIPTION OF ROAD MAKING.

J. J. ETRIDGE, Jr.
SLATE MERCHANT,
SLATER and TILER.
Penrhyn-Bangor,
Oakeley - Portmadoc,
And every other description of Slates, except American, Ready for immediate delivery to any Railway Station.
RED SANDFACED NIBBED ROOFING TILES ALWAYS IN STOCK.
Applications for Prices, &c., to
BETHNAL GREEN SLATE WORKS,
BETHNAL GREEN, LONDON, E.

IRON FIRE ESCAPE & SPIRAL STAIRS.
COALBROOKDALE Co., Ltd.,
141, Queen Victoria St., London, E.C.

THE BATH STONE FIRMS, Ltd.
BATH.
FOR ALL THE PROVED KINDS OF BATH STONE.
FLUATE, for Hardening, Waterproofing, and Preserving Building Materials.

HAM HILL STONE.
DOULTING STONE.
The Ham Hill and Doulting Stone Co.
(incorporating the Ham Hill Stone Co. and C. Trask and Son, The Doulting Stone Co.)
Chief Office :—Norton, Stoke-under-Ham, Somerset.
London Agent :—Mr. E. A. Williams, 16, Craven-street, Strand.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co.

SPRAGUE & CO., Ltd.,
LITHOGRAPHERS,
Employ a large and efficient Staff especially for Bills of Quantities, &c.
4 & 5, East Harding-st., Fetter-lane, E.C.

QUANTITIES, &c., LITHOGRAPHED accurately and with despatch. [Telephone No. 434 Westminster.
METCHIM & SON { 3, PRINCES STREET, S.W. and 22, CLEMENT'S LANE, E.C.
"QUANTITY SURVEYORS' DIARY & TABLES," For 1905, price 6d., post 7d. In leather 1/-, post 1/1.

JOINERY
Of every description and in any kind of Wood.
CHAS. E. ORFEUR, LTD.,
ESTIMATES ON APPLICATION.
COLNE BANK WORKS, COLCHESTER.
Telephone: 0195. Telegrams: "Orfeur, Colchester."

ASPHALTE
For Horizontal & Vertical Damp Courses.
For Flat Roofs, Basements, & other Floors.
Special attention is given to the above by
THE
French Asphalte Co.
Contractors to
H.M. Office of Works, The School Board for London, &c.
For estimates, quotations, and all information apply at the Offices of the Company,
5, LAURENCE POUNTNEY HILL, CANNON STREET, E.C.

"Drop Dry" Glazing
ECONOMICAL, EFFECTIVE. THE PERFECT SELF-SUSTAINING BAR.
Copper & Zinc Roofing.
The most Efficient and Economical System in the Kingdom.
Designs and Estimates Free on Application.
Telegraphic Address: "COURTEOUS, LONDON." **F. BRABY & CO., LTD.** Telephones: Nos. 783 and 457 King's Cross.
Chief Offices: 352-364, EUSTON ROAD, LONDON, N.W.
Works: LONDON, LIVERPOOL, BRISTOL, GLASGOW, FALKIRK.